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AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

MACADAM (William). *Entamoeba histolytica* **Infections: Their Prevalence among British Troops in India and Mesopotamia, with Special Reference to the Question of "Clearing."**—*Lancet.* 1918. Jan. 5. pp. 15–19.

This paper is a preliminary account of the results of an inquiry based on the protozoological examination of stools of men invalided for various ailments from Mesopotamia to India.

It was found that the stools of patients in several of the surgical wards revealed a higher percentage of *histolytica* cysts than did those of patients who were being "cleared" in the dysentery wards. The prevalence of *histolytica* infections among the troops was therefore investigated. In a series of 946 men, 351 were at the time of stool examination in the "non-dysentery" wards of the hospital and 595 were convalescents stationed in a convalescent depot. *Histolytica* cysts were present in 13·6 per cent of the 351, and 17·8 per cent. of the 595; this being the result of a single examination. These figures by correction could probably be increased to 34 per cent. for the non-dysenteric group and 44·5 for the convalescent group. That is to say that one third at least of the men in the ordinary wards of the hospital and of the men who have been ill but are now considered fit for duty are *histolytica* carriers. The number of carriers is greater among those who have shown symptoms of an intestinal infection than among those who have been unaware of their protozoal infection, as indicated by the following tables.

Table I.—Classification of *Histolytica* Carriers among 351 Hospital Patients Based on Presence or Absence of a History of Dysentery.

	Number.	Carriers.
Previous history of dysentery or diarrhoea	218	41 = 18·8%
No previous history	133	7 = 5·2%

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Table II.—Classification of *Histolytica* Carriers among 595 Convalescents, Based on Presence or Absence of a History of Dysentery.

	Number.	Carriers.
Class A.—No dysentery or diarrhoea	154	19 = 12·3%
Class B.—Remote history of dysentery or diarrhoea	246	49 = 19·9%
Class C.—Recently discharged from hospital after dysentery..	195	38 = 19·4%

The authors make comments upon the value of negative examinations of patients who are living under a hospital régime. They were impressed by the fact that patients who had been discharged from hospital and had, owing to error in diet, brought on an attack of diarrhoea gave more frequent positive results. They followed up this question. Twenty known carrier cases were examined after leaving hospital as "cleared." The average number of negative examinations after emetine treatment and before the patients were discharged from hospital was five and at the time of discharge the patients' condition of health was satisfactory. At the very first examination after the men went to the convalescent depot, 10 were found to have relapsed while 5 others shewed cysts at the second or third examination. In only 3 out of the 20 cases was there no evidence of *histolytica* infection after seven consecutive stool examinations.

MacAdam's conclusions include the following:—

"7. This wide prevalence of infection due to *Entamoeba histolytica*, coupled with the fact of the proved ineffectiveness of our present therapeutic methods for the destruction of cysts, throws considerable doubt on the utility of attempting to 'clear' by a series of protozoological examinations of the stools, only those cases of amoebic infection which have suffered from so marked an intestinal disturbance as to have resulted in their receiving hospital treatment.

"8. Various data have been cited showing that factors leading to the production of intestinal irritation, mild though it be, are also associated with the reappearance of *histolytica* cysts in the stools. Such factors are present under the conditions that prevail in the convalescent depôt, and doubtless exist to a much greater extent during active service in the field, in sharp contrast to the conditions of a hospital régime."

B. Blacklock.

CIAURI (Rosolino). **Dissenteria amebica.**—*Giorn. di Med. Milit.* 1917. Nov. 30. Vol. 65. No. 11. pp. 934–941. With 1 plate.

The author states that his observations in 990 cases from Macedonia and Lybia lead him to certain conclusions which he gives in this paper, and which are treated in a general way, few details being given. He made some experiments to ascertain whether faeces of amoebic dysentery cases were capable after filtration of producing dysenteric symptoms or lesions in kittens and guinea-pigs. Subcutaneous and intrarectal injections were used, and no dysenteric signs appeared, but the animals injected subcutaneously died early. Non-filtered material from the same source produced dysentery when injected rectally.

He discusses fully a case presenting the following features. The patient became ill in September 1916, in Lybia, with dysenteric symptoms. He recovered partially without special treatment but had

several relapses until February 1917, from which time he remained in hospital until July. In the faeces were found amoebae and cysts. The author describes these and says "it seems that all the morphological structures of this amoeba agree in most points with the morphology of *Loeschia coli* (little or no differentiation between ecto and endoplasm, vacuolization of protoplasm, cysts with eight nuclei); where it differed from the ordinary *Amoeba coli* was in its definite property of ingesting besides bacteria and detritus, red cells, and in the fact that it was the only parasite which could be found in this case to account for dysentery of long standing." He has observed that the power of ingesting red cells is lost by those amoebae which are refractory to administration of emetine.

Kittens were injected rectally with the faeces of the patient and one of them died in thirteen days. The conditions found at autopsy were:—Early rigor mortis, rectal prolapse, redness of the peritoneum, intense redness with great swelling of the mucosa of the sigmoid and rectum with punctiform submucous haemorrhages, superficial ulceration of the mucosa; tumefaction and congestion of liver and spleen, tumefaction of the pancreas, enlargement of lymphatic glands; kidneys enlarged and congested with loss of cortico-medullary line of demarcation, heart large with dark fluid blood, slight general congestion of the lungs. The author states he will as soon as possible furnish a description of sections. Amoebae perfectly similar to those found in the patient's faeces were present in material from the mucosa of the kitten's colon. Vesicular bodies and vacuoles of large size were found in the amoebae in the kitten which were not seen in the amoebae from the patient.

The author concludes that in the absence of important zoological facts such as the character of multiplication we do not at present possess sufficient data to enable us to establish different species of dysentery amoebae, that *Amoeba coli* may in certain circumstances assume the power of producing dysentery, and that a basic character for determining pathogenic properties in amoebae is the power of ingesting red cells.

B. B.

GABBI (Umberto). **Dissenteria amebica.**—*Malaria e Malat. d. Paesi Caldi.* 1917. Sept.-Dec. Vol. 8. No. 5–6. pp. 218–240. With 6 text-figs. & a map.

In this paper the author reviews the whole subject of amoebic dysentery in a study which will be of use for those who are commencing the subject. It is not a record of any original work, but rather a summary of the views of those who have been engaged for many years in the study of amoebic dysentery.

B. B.

MARTINEZ (Fidel F.). **La dysenterie tropicale en Espagne.**—*Bull. Soc. Path. Exot.* 1917. Dec. Vol. 10. No. 10. pp. 904–915.

In previous papers, states the author, he recorded his discovery in South Spain of infantile kala azar, hitherto classed among splenomegaly with anaemia, also the first case of beriberi in Spain and many cases of Oriental sore, pellagra, etc. The present paper deals with amoebic dysentery and the author, who had already come to the conclusion that amoebic dysentery is endemic in certain parts of Spain on account of the specific action of emetine in his cases of

dysentery, found the amoeba in human stools and infected kittens by the rectum. He has now more than 50 cases which prove the endemicity of the infection. The major part of the paper is concerned with accounts of cases and general observations on symptoms and treatment.

B. B.

POPPER (Hugo). **Ueber den Erreger der galizischen Ruhr.** [The Cause of Dysentery in Galicia.]—*Wien. Klin. Woch.* 1917. Nov. 8. Vol. 30. No. 45. pp. 1413–1415.

Dysentery has become widely spread in Eastern Galicia in recent months. Dysentery bacilli can only rarely be recovered from the stools, but in nearly every case an amoeba, differing in certain respects both from *Amoeba coli* and *Amoeba histolytica.* Popper describes this amoeba, both in its vegetative and encysted condition, and considers it to be the cause of the dysentery. As amoebae have not hitherto been recognised as the cause of epidemic dysentery in Europe, he proposes for his amoeba the name *Entamoeba dysenteriae europaeae.*

F. E. Taylor.

SPEARES (John). **Some Preliminary Points in the Diagnosis of Amoebic Dysentery.**—*Dublin Jl. Med. Sci.* 1918. Jan. 3 Ser. No. 553. pp. 6–11.

The author considers that in dysentery naked eye examination of stools to determine whether the case is due to *E. histolytica* or is bacillary in origin, is useless. He lays stress on temperature as of diagnostic value, and then proceeds to give a description of the technique which he uses in the diagnosis of cysts. Some observations on hepatitis and liver abscess conclude the paper, the author stating that in these conditions the diagnosis should not depend on laboratory examination of the stools, and he draws attention to the fact that puncture of the abscess will not provide material suitable for microscopical diagnosis unless a portion close to the abscess wall be examined.

B. B.

BRUG (S. L.). **Les kystes des amibes intestinales de l'homme.**—*Bull. Soc. Path. Exot.* 1917. Nov. Vol. 10. No. 9. pp. 799–803. With 6 text-figs.

The author passes in review the differential points which have been made very frequently in the past between *E. histolytica* and *E. coli,* both in vegetative form and in cyst form. One by one he discards them as of no diagnostic value. He states clearly that cysts of amoebae which are the cause of dysentery may bave 8 nuclei, also that cysts of what should be undoubted *Entamoeba coli* (some having 16 nuclei) may possess chromidial bars. "In fact" the author states "we see that among the so-called characteristic points there is not one which is not contested." [The table at the end of this paper in which are set forth the points by which the cysts of *E. histolytica* and *E. coli* may with reservations, be differentiated, appears somewhat unnecessary in view of the preceding statements.]

B. B.

NOC (F.). **Prophylaxie de l'amibiase intestinale par l'ipéca total glutinisé.**—*Bull. Soc. Path. Exot.* 1917. Dec. Vol. 10. No. 10. pp. 868–870.

In amoebic infection of the intestine no remedy is known which effects a *Therapia sterilisans magna.* Therefore it is of value to discover whether prophylactic measures can be adopted to prevent infection or relapse. The author at Saigon tried the effect of ipecacuanha in the form of "pilules d'extrait total glutinisées," which contain each 26 mgm. total extract of ipecac corresponding approximately to 15 mgm. of emetine. In a healthy man one to three daily for long periods produce no constipation nor diarrhoea. Vomiting is never produced even by the dose of 8 pills a day. They dissolve entirely in the alimentary tract. The author tried them on two healthy subjects and on 20 amoebic dysenterics and considers the effect should be studied accurately for long periods in tropical countries.

B. B.

BOUYER. **Crises de dysenterie amibienne après vaccination antityphique chez un porteur de germes.**—*Paris Méd.* 1917. Sept. 22. Vol. 7. No. 38. pp. 255–256.

A soldier who had lived in an endemic area, but had presented no evidence of amoebic dysentery, had an acute dysenteric attack a few hours after each of two antityphoid vaccinations. The first was given in 1911, the second in 1916, the resulting symptoms being on each occasion colic with diarrhoea and the passing of blood and mucus. On the second occasion amoebae were found in the stools. No dysenteric symptoms occurred in the interval of four years between the injections.

B. B.

JEPPS (Margaret W.) & MEAKINS (J. C.). **Detection and Treatment with Emetine Bismuth Iodide of Amoebic Dysentery Carriers among Cases of Irritable Heart.** (Report to the Medical Research Committee.)—*Brit. Med. Jl.* 1917. Nov. 17. pp. 645–648.

Sixty-five cases of irritable heart were examined as regards presence of *E. histolytica* in the faeces. No selection of the men was made from the point of view of history of dysentery, but twenty-five cases had a definite history of an acute attack. *E. histolytica* was present in twenty-four cases out of the sixty-five, six examinations being carried out before declaring a man uninfected. It is noted that small (6 to 10μ) cysts only were found in twelve out of the twenty-four cases. Treatment with preparations of emetine bismuth iodide in stearin-coated tablet and pill form was unaccompanied by vomiting but in eight cases severe diarrhoea and abdominal cramps occurred. In eleven cases treated with the drug in cachets nausea and vomiting occurred in all. The curative results obtained were in favour of the last mode of administration, 10 of the 11 cases being cured. The effect on the patients' heart condition of the removal of the amoebic infection was studied. Of a total of twenty [? nineteen] infected cases which were cured, eleven showed a conspicuous improvement, nine showed little or none. The test applied was graduated exercise.

Methyl-psychotrine, a new alkaloid prepared from ipecacuanha by Dr. F. L. PYMAN, was tried in two cases with negative results. Some observations on differential leucocyte counts are added.

B. B.

LAMBERT (A. C.). **The Treatment of Amoebic Dysentery with Emetine and Bismuth Iodide.**—*Brit. Med. Jl.* 1918. Jan. 26. pp. 116–118.

The patients, 40 in number, who were treated were Indians and it was found that they tolerated the drug well, although keratin capsules were not available. A pill containing two grains was given once or twice daily, half an hour after milk. The author classifies his cases into acute, subacute and chronic relapsing, the diagnosis being made and the results of treatment observed microscopically. He found that attempts to use emetine bismuth iodide alone in acute cases did not give good results, but that combined with hydrochloride injections it proved effective.

B. B.

DALE (H. H.) & DOBELL (Clifford). **Experiments on the Therapeutics of Amoebic Dysentery.**—*Jl. Pharmacol. & Experim. Therap.* 1917. Dec. Vol. 10. No. 6. pp. 399–459.

The authors have been successful in carrying on a strain of *E. histolytica* in kittens for forty three passages over seven months by rectal injection. The strain was then perfectly active and unaltered and was voluntarily abandoned. The material was derived from a patient who was suffering from subacute dysentery, and it contained "a small amount of blood and mucus with active *Entamoeba histolytica* but no cysts." The procedure adopted for carrying on the strain was to kill the experimental animal on the appearance of the terminal symptoms of collapse, and take material direct from the large intestine. The material consisted of the slime and ulcerated mucous membrane scraped off and emulsified in saline solution (0·9 per cent. solution of sodium chloride in London tap water) by drawing up into a Record 10 c.c. syringe repeatedly. The syringe was connected with a straight glass rectal tube—7 cm. in length and 3 mm. in external diameter—by a short rubber tube, and 5 to 8 c.c. of the emulsion was injected, the animal being held head down. Introduction of live amoebae into the stomach by a tube, and into the small intestine failed to produce infection, although the amoebae used were capable of producing infection when introduced rectally. The authors confirm other observers as to the greater susceptibility of young kittens, and as to the non-production of cysts in kittens. Two monkeys (*Macacus rhesus*), rats and rabbits proved refractory.

Systematic series of observations on the action of various alkaloids *in vitro* were carried out on the kitten amoebae, for the details of which the reader is referred to the paper itself. The alkaloids included emetine, cephaeline, psychotrine, methyl-psychotrine and various derivatives. Quinine, harmaline, cusparine hydrochloride, neosalvarsan, trypaflavin, blood serum of cat, mercury succinimide, copper alanine and chaparro amargosa were also tested. Many other substances proved, *in vitro*, more potent in their lethal action on *E. histolytica* than did emetine. The authors found themselves at variance

with previous observers, such as ROGERS, in regard to this action of emetine. The dilution of 1 in 100,000 which ROGERS found caused immobi ization and degeneration of the amoebae within a few minutes proved of no effect. The dilution 1 in 10,000 which ROGERS found immediately lethal, was also only exceptionally productive of any effect up to 30 to 60 minutes. Even a dilution of only 1 in 100 or 1 in 200 was resisted by the kitten amoebae in some experiments for a period of 30 minutes. The subject is discussed from many points of view by the authors and they exclude by experiment such reasons as acquired emetine resistance of the strain, failure on their part to observe the phenonema of degeneration, the use of kitten amoebae instead of human amoebae, and the quality of the emetine used. The conclusion of the authors is that ROGERS' observation was fallacious and they suggest in explanation of the results obtained by him, that the amoebae in his specimen had become so enfeebled that they succumbed to emetine in dilutions which are harmless to those with unimpaired vitality. [It is of interest to recall that VEDDER himself stated that ROGERS' experiments on the action of emetine on *E. histolytica* in stools are unimportant, this *Bulletin*, Vol. 3, p. 449. See also paper by WALTERS, BAKER, and KOCH, below.]

Attempts to treat amoebic infection in the cat failed and this is a fact which the authors emphasize. They consider that present views on the mode of action of emetine in amoebic dysentery require modification. They ascribe the efficacy of emetine to its action not on the amoebae, but on the host.

B. B.

PYMAN (F. L.) & WENYON (C. M.). **The Action of Certain Emetine Derivatives on Amoebae.**—*Jl. Pharmacol. & Experim. Therap.* 1917. Oct. Vol. 10. No. 4. pp. 237–241.

Culture experiments were carried out with a water amoeba of the limax type on WALKER's agar medium. The amoeba grew freely on this when the medium was free from the drugs tested. The strengths of drug used in the medium were 1 : 1,000, 1 : 10,000 and 1 : 100,000. The results are shewn in the form of tables giving the amount of amoebic growth and the amount of bacterial growth obtained on the plates. The culture test gave the following division of the Emetine derivatives.

"1. The salts of emetine, cephaeline, N-methyl emetine, N-methyl cephaeline, and N-methylemetine methine were approximately equally amoebacidal.

"2. N-Methylemetine methochloride, rubremetine hydrochloride, the hydrochloride B, and noremetine hydrochloride were inferior to those of the first group in amoebacidal action.

"3. Psychotrine sulphate was much inferior to the substances of group 2."

A discussion on the constitution of the various derivatives follows. In a foot note it is stated, "Full particulars of the chemical and physical properties of these compounds are given in the papers by CARR and PYMAN, *J. Chem. Soc. Trans.* 1914. CV. 1591, and PYMAN 1917. CXI. 419."

B. B.

WALTERS (A. L.), BAKER (W. F) & KOCH (E. W.). **Pharmacologic Studies of the Ipecac Alkaloids and some Synthetic Derivatives of Cephaeline. III. Studies on Protozoocidal and Bactericidal Action.** —*Jl. Pharmacol. & Experim. Therap.* 1917. Nov. Vol. 10. No. 5. pp. 341–364.

The Sections on Protozoa deal with the action of the drugs on water amoebae, on *Endamoeba buccalis* and Paramoecia. Full details of a large series of experiments are tabulated for each section. The authors conclusions are reproduced below.

"Emetine hydrochloride in solution of 1 : 1000 when acting on water amebas for one hour, or in solution of 1 : 5000 acting for three hours, destroyed many of these organisms but was not uniformly amoebacidal.

Emetine hydrochloride in solution of 1 : 200,000 in contact with cultures of amebas for one hour, four hours, or seven hours destroyed many amebas, but transplants from these cultures to fresh agar plates showed a retarded or delayed growth of amebas, due probably to the development of encysted or resistant forms.

"Emetine hydrochloride in solutions as strong as 1 : 100 are not rapidly destructive to the endameba buccalis, in some cases not killing them in one hour.

"The propyl and iso-amyl ethers of cephaeline are stronger than emetine as amebacides but their action on water amebas or the Endameba buccalis cannot be used satisfactorily as a comparative measure of this action.

"Methylating cephaeline to form emetine is known to increase the endamebacidal action as well as the protozoocidal action towards paramecia and the substitution of the methyl group by ethyl, propyl, butyl, iso-amyl, or allyl further intensifies this action.

"The propyl, butyl and iso-amyl ethers of cephaeline possess much stronger protozoöcidal properties than the methyl ether (emetine). Cephaeline iso-amyl ether phosphate was the most effective alkaloid of this group in killing paramecia, being fifteen to twenty times as active as emetine phosphate."

B. B.

SANGIORGI (Giuseppe). **La colorazione vitale per la dimostrazione delle cisti dell'** *Entameba coli* **e dell'** *Entameba dissenterica.*—*Pathologica.* 1918. Jan. 1. Vol. 10. No. 219. pp. 9–10.

The author recommends MEYROWSKY'S alcohol methylene violet for use in staining cysts for diagnostic purposes. A drop of water emulsion of the faeces to be examined is placed on a slide on which the stain has been spread in a thin film and dried,—and a cover slip is applied. Where cysts are rare he recommends CROPPER and ROW'S method of concentration [this *Bulletin*, Vol. 9, p. 421].

B. B.

CUTLER (D. W.) & WILLIAMSON (R.). **A Rapid Method for the Differentiation of the Amoeboid Forms of** *Entamoeba histolytica* **from those of** *Entamoeba coli.*—*Jl. Path. & Bact.* 1917. Oct. Vol. 21. No. 4. pp. 511–513.

The authors find that on emulsifying faeces containing amoebae in a stain consisting of 1 in 10,000 neutral red in 0·85 per cent. sodium chloride solution the amoebae will take up the stain if they are *E. histolytica*, but not if they are *E. coli.* Cysts remain unstained.

Where ingested blood cells were present the amoebae containing them always appeared pink. Of thirty cases where *E. histolytica* cysts had been found previously, twelve shewed pink amoebae, associated with *E. histolytica* cysts. In 15 cases in which only pink amoebae were found, *E. histolytica* cysts were found subsequently. In all cases in which *E. coli* cysts were found with active amoebae the latter have remained unstained.

The authors, writing of amoebae which had stained pink and from which stained films (Heidenhain's iron haematoxylin) had been prepared, say "The appearances of the stained amoebae were characteristic of *E. histolytica.*" Later on they state, "Amoebae with pseudopodia and sluggish movements characteristic of *E. coli* have remained quite colourless."

B. B.

CHATTON (Edouard). i. **Réalisation expérimentale chez le cobaye de l'amibiase intestinale à** *Entamoeba dysenteriae.*—*Bull. Soc. Path. Exot.* 1917. Nov. Vol. 10. No. 9. pp. 794–799. With 3 text-figs.

ii. **Les caractères de l'amibiase intestinale du cobaye à** *Entamoeba dysenteriae*: **localisation caecale, absence de dysenterie, importantes réactions hyperplasiques.**—*Ibid.* 1918. Jan. Vol. 11. No. 1. pp. 23–26.

i. The author inoculated 6 guinea-pigs, 3 by ingestion of cysts and 3 by intrarectal injection of dysenteric amoebae. In each group one animal died. "That of the second group" the author says "was infected by the *ingestion* of amoebae from the guinea-pig of the first group, themselves the issue of cysts of human origin." [The italics are the reviewer's. The word should probably be injection, as stated above.] The author considers frankly the possibility of the conditions found at autopsy (one animal died in 20 days, the other in 9) being due to some other agency than the amoeba in question; he concludes however that he has successfully produced amoebic infection of the gut of guinea-pigs by means of human dysenteric amoebae. No dysenteric symptoms were produced.

ii. The first point which is emphasized in this paper is the fact that in the guinea-pig the site of election of the amoeba is the caecum. From this localisation of the amoebic process of tissue invasion the absence of signs of dysentery in the infected guinea-pig can be explained. The chief lesion on which the author lays stress is a hyperplasia of the epithelium of the glands of Lieberkühn, observable in those regions of the gut wall where necrosis is not too far advanced. This condition results, the author suggests, in this region from an attraction of the amoeba to the mucus, under the influence of which the amoebae pass down the glands to their bases where the mucin cells predominate. It is here that penetration of the muscularis mucosae occurs and this forms the point of entry of the amoeba into the submucosa. The author refers to the observation of HADLEY (this *Bulletin*, Vol. 10, p. 146) on the mode of entry of Trichomonas into the mucous membrane of the caecum of turkeys.

B. B.

CHATTON (Edouard). **L'éclosion des kystes et les premiers stades de l'évolution de l'amibe dysentérique humaine chez le chat.**—*Bull. Soc. Path. Exot.* 1917. Nov. Vol. 10. No. 9. pp. 834–841. With 9 text-figs.

The author made experiments with cats in order to determine the mode, place and time of liberation of the contents of amoebic cysts (*E. histolytica*) when ingested by cats. He gives details of several of his experiments, which resulted in very uniform findings.

His conclusions are :—

1. Morphological.—The cysts traverse the stomach without undergoing modification other than the digestion of the crystalloid bodies. They open in the small intestine by dissolution of their envelope. The amoeba is liberated entire. If it divides this division is late. No indication of it has been observed. The amoeba passes through a stage in which its ectoplasm is finely alveolar when it is very little mobile, to one in which the cytoplasm is vacuolated when amoeboid movement and phagocytic power for bacteria are well developed. The nuclear system presents as its only modification a close approximation of the nuclei beginning from the stage of vacuolization. No indication of the evolution of the 1-nucleated form from the 4-nucleated was obtained.

2. Physiological.—The existence of a stage of bacterial phagocytosis in the cycle of the amoeba of dysentery (which is evidence of the condition through which it has passed in the course of its phyletic evolution before becoming more specifically parasitic) explains how its implantation and increase in a host may be conditioned very strictly by the intestinal flora of the host. The perfect cyst with 4-nuclei and crystalloids is ready to open without a period of maturation. There is no maturation during the sojourn of the cyst outside the body. The only phenomenon apparent, namely the resorption of the crystalloids towards the third day, appears to represent the utilization of a reserve. In material kept without special precautions, cysts have proved able to open at the end of 10 days, which does not appear to be the maximum.

3. Practical.—The immediate maturation of cysts which renders direct contagion possible, their prolonged conservation in dejecta, their carriage by flies, whose intestine they traverse without modification, are reasons for applying rigorously the prophylactic measures laid down by the Sanitary service.

B. B.

BRUG (S. L.). **Een paar nieuw ontdekte darmparasieten.** [Two New Intestinal Parasites.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1917. Vol. 57. No. 4. pp. 570–578. With 1 plate.

The author critizes WENYON and O'CONNOR who, he says, have called by the name *Entamoeba nana* an amoeba which is more closely related in its nuclear structure to limax than the genus Entamoeba ; the name, he suggests should be *Vahlkampfia nana.* He proceeds to describe a small amoeba which he calls *E. minutissima.* The largest are 11 by 6μ or 9 by 8μ, the smallest 4 by 4μ, the usual size being 7 by 6μ and 6·5 by 5μ. The author details the points of distinction between this organism and *Vahlkampfia nana* on the one hand and *E. histolytica* on the other.

The second portion of the paper deals with I. cysts in some detail.

B. B.

MERCIER (L.) & MATHIS (C.). **Kystes gamogoniques et schizogoniques chez** *Entamoeba ranarum.*—*Bull. Soc. Path. Exot.* 1918. Jan. Vol. 11. No. 1. pp. 47–54. With 2 plates.

The authors consider that the large cysts of *E. coli* containing more than eight nuclei should be regarded as having a place in the normal cycle of development of *E. coli*, being schizogony cysts. In order to obtain further information on this question they studied the conditions present in the case of *E. ranarum.* A description of the vegetative stage is given and a section on the process of simple division and formation of gamogony cysts containing four nuclei and siderophile inclusions. The size of the cysts is usually 12 to 14μ in fixed and stained preparations, the nuclei measuring 2 to 2·5μ.

The authors confirm the observations of COLLIN (1913) who first described the mode of multiplication by schizogony in *E. ranarum*, which he observed in the tadpole, but not in the frog. The amoebae, measuring from 25 to 40μ, present an amitotic division of the nucleus differing entirely from the mesomitotic division which was found to occur in the development of the gamogonous cysts. The two-nucleated forms resulting from this process proceed to divide further by binary but not always by synchronous division, so that 3 to 8 nucleated forms result, the nuclei being of unequal sizes. Further division of the nuclei of the schizonts proceeds and the number of 20 to 30 or more nuclei may be attained. The schizonts break up into uninucleated schizozoites which grow larger and encyst at a four nucleate or later stage, the cysts measuring from 10 to 18μ in diameter and never containing siderophile inclusions. Variations in the process are described. The conclusion is that in *E. ranarum* as in *E. coli* there occur cysts which arise from multinucleated amoebae. These cysts are characterized by their great variations in size, the number of their nuclei and the absence of siderophile inclusions.

B. B.

OEHLER (Rud.). **Amöbenzucht auf reinem Boden.** [Culture of Amoebae on Pure Media.]—*Arch. f. Protistenk.* 1916. Dec. 27. Vol. 37. No. 2. pp. 175–190. With 1 plate.

Using 5 strains of Amoeba the author has observed their development in culture with various bacteria, and finds that on the whole little morphological modification can be traced in them which can be attributed to their being cultivated with bacteria. Great difference in success of amoebic growth was observed with different pure cultures of bacteria. This the author attributes to the absence or presence of chemical products of the bacteria on various media. *B. prodigiosus* grown on broth-agar is an unfavourable medium for the growth of amoebae on account of the production of Trimethylamine. In the case of *B. subtilis* the amoebic culture was obtained by growing the bacteria on a 1-2 per cent. water agar plate, and once obtained was easily carried on. Gram negative bacteria on plates proved more efficient in media than Gram positive. All the amoebae studied migrated over the plates to a greater or less extent and the author uses this degree of wandering as a diagnostic point. A comparison between young and old bacteria gave indications that young bacteria afford in many cases a better medium for amoebic culture.

Non-bacterial nutriment such as drops of oil, red blood cells, fibrin threads and starch granules were not taken up by the amoebae.

A strain of small amoebae was grown on a *B. coli* plate and quickly grew over it. Large amoebae-Amoeba I.—*Hartmannella aquarum* or *Vahlkampfia magna*, were then inoculated on the plates and all behaved in exactly the same manner, growing rapidly at the expense of the small amoebae. These were taken up by the large amoebae and appeared on a first glance like nuclei of the larger amoebae. An amoeba of swine did not ingest the small amoebae.

The author was successful in growing amoebae on killed bacteria which were smeared on plates. *Hartmannella aquarum* and *Vahlkampfia magna* grew on *B. coli.*, sarcina or yeast autoclaved at 130° for 1 hour. He refers to the work of the Japanese TSUJITANI and confirms it. Amoebae which grow on live bacteria can be grown on them when the bacteria have been killed by various methods and can then be carried on in culture free from contamination. Experiments were made to determine whether the amoebae took up as nourishment fluid egg albumen, peptone and sugar. The result showed that these did not constitute a food sufficient for amoebae. In one of the amoebae cultured—that from the swine—it was found that grape sugar added to the *B. coli* agar on which the amoebae were growing caused the appearence of enormous multinucleated forms. From 2 to 20 nuclei could be found in such a cell, the cell being rounded and 50 to 150μ in size.

B. B.

ABRIOL (Rufino). **Amoebic Abscess of the Liver among Filipinos.**—*Philippine Jl. Sci.* Sec. B. Trop. Med. 1917. May. Vol. 12. No. 3. pp. 121–147.

This is a thesis written for degree purposes and contains a considerable amount of original work together with observations made by previous workers. The conclusions are :—

"1. Seventy-nine per cent. of liver abscess cases among Filipinos as seen at the Philippine General Hospital are distinctly associated with intestinal amoebiasis.

"2. Liver abscess is relatively frequent among Filipinos.

"3. There is apparent predominance of cases of liver abscess among Filipinos during the cool and rainy months.

"4. The age incidence corresponds with that of other countries.

"5. Filipino women are not as immune to the disease as European or American women.

"6. Occupation plays an important role in the etiology of liver abscess, as in certain occupations the individuals are brought to a condition or position favourable to infection.

"7. The right lobe is the most frequent site of the abscess in our cases among Filipinos.

"8. Fever is not typical in cases of amoebic abscess of the liver.

"9. There is nothing characteristic in the pain symptoms.

"10. The blood picture varies—being normal in many cases. In the majority of the cases, the polynuclear count is normal. There is no eosinophilia in our cases, nor is there any increase in the mononuclears.

"11. Diagnosis is easy in advanced cases, but extremely difficult in early cases with small abscesses.

"12. Intestinal haemorrhage as a complication of liver abscess is not necessarily fatal.

"13. Mortality among Filipino cases is relatively low, in spite of the fact that they come very late for treatment."

B B.

LOEW (Johann). **Das Vorkommen der Amöbenenteritis im Küstengebiete der Adria.** [Amoebic Dysentery on the Adrian Coast.]—*Wien. Med. Woch.* 1917. Feb. 24. Vol. 67. No. 9. pp. 452–453.

The author considers it possible that infections with amoebae causing dysentery may occur in temperate climates, but it is unlikely that great epidemics will occur as the conditions for spread are not favourable. He describes two cases of his own and refers to RIEGEL's cases. Speaking of the vegetative stage of the amoebae of dysentery, he says "its appearance when full grown is so characteristic that a mistake is hardly possible."

B. B.

VICKERY (E. A.) & MCMULLIN (J. J. A.). **Amoebiasis with Constipation.**—*U. S. Nav. Med. Bull.* 1917. Oct. Vol. 11. No. 4. pp. 540–541.

The authors give a short account of two cases of marked and obstinate constipation in cyst carriers, one with a history of an acute attack of dysentery one year previously, the other with no such history. They consider that such cases might easily be mistaken for chronic intestinal obstruction. [No evidence is given to shew that the amoebic condition was responsible for the symptoms in these two cases.]

B. B.

i. CHATTON (Edouard). **Au sujet des Cristalloïdes (Chromidium, corps chromatoïdes, bâtonnets ou plages sidérophiles) des kystes d'Entamibes.**—*Bull. Soc. Path. Exot.* 1917. Nov. Vol. 10. No. 9. pp. 791–794.

ii. MATHIS (C.) & MERCIER (L.). **A propos du soi-disant chromidium des kystes des entamibes.**—*Ibid.* Dec. No. 10. pp. 866–868.

i. This is a criticism of the views expressed by MATHIS and MERCIER as to the significance and origin of the inclusions in cysts of amoebae, variously termed chromidia, siderophile bodies and crystalloid bodies [see this *Bulletin*, Vol. 11, p. 53]. The author denies the possibility of differentiating between the bodies as found in *E. histolytica* cysts and *E. coli* cysts and considers that in neither case are they of nuclear origin, but on the contrary that in both cases they are derived from the protoplasm and are perivacuolic. He states that his views have now been adopted by MATHIS and MERCIER apparently as a discovery of their own, and that the new terms applied by them are merely confusing.

ii. A reply to CHATTON's article. The authors admit that the question is not of vital importance but reply in order to shew that CHATTON is by no means misrepresented by them. This they do by quotation from his and their works.

B. B.

BACILLARY DYSENTERY.

MAER (C. Muriel Astley). **A Case of Septicaemia due to Infection by *Bacillus dysenteriae* Shiga.**—*Brit. Med. Jl.* 1918. Jan. 19. p. 84.

The author records a fulminating case of dysentery with a fatal issue from toxaemia, in which the temperature never rose above 100·2°, marked cerebral symptoms were present, but abdominal pain, tenderness, straining and tenesmus were absent. Neither amoebae nor dysentery bacilli were found in the stools. Blood culture yielded a profuse pure growth of Shiga's bacillus. Post mortem examination

showed the whole mucous membrane of the large intestine to be intensely congested and studded throughout with minute superficial ulcers. Shiga's bacillus was isolated from scrapings of the mucous membrane of the lower bowel.

F. E. Taylor.

FLETCHER (A. A.). **Notes on the Treatment of Bacillary Dysentery.**—*Canadian Med. Assoc. Jl.* 1917. Dec. Vol. 7. No. 12. pp. 1094–1096.

These observations were made during an outbreak of dysentery among the Salonika Forces in the summer of 1916. Of 98 cases examined bacilli of the Shiga type were found in 78, whilst the other 20 belonged to the Flexner group.

Good results were obtained by fluid diet, salines, colonic lavage and serum. The Polyvalent antidysenteric serum of the Lister Institute was given to all the cases. In severe cases 80–100 cc. was given intravenously the first day in a single or divided dose, 60 cc. on the second and when necessary a further 60 cc. on the third day. Further administration of serum did not seem to influence the course of the disease even where blood and mucus were still present in the stools. The Flexner dysenteries were often mild and cleared up well without serum. The severe ones did not react as favourably to serum treatment as those infected with the Shiga bacillus.

F. E. T.

DUFOURT (P.) & DEVIC (A.). **Du traitement de la dysenterie bacillaire aigue.**—*Lyon Méd.* 1917. Dec. Year 49. Vol 126. No. 12. pp. 541–552.

The authors consider that in serum therapy we possess a treatment with almost absolute efficacy against acute bacillary dysentery. This treatment should be commenced at the beginning of the disease and large and repeated doses of the serum should be given. The dysenteric syndrome improves rapidly and a short and favourable convalescence ensues. Where the serum is ineffective abnormal forms are present, such as are associated with amoebae or aberrant bacilli. The fear of serum reactions which are more or less frequent, and of anaphylactic accidents which are exceptional, are never contra-indications against serum therapy. These reactions and accidents are in all cases absolutely independent of the dose of serum injected. Dysenteric arthritis should not be wrongly diagnosed. Medication accessory to serum therapy, such as saline injections and adrenaline, is of real value. Dehydration and denutrition must be contended with. Lastly prophylactic treatment—disinfection, washing the hands, etc.—should not be overlooked.

F. E. T.

FIGUEIRA (Luis). **Um caso de disenteria. Isolamento de um bacilo do tipo Shiga.** [A Case of Dysentery of the Shiga Type.]—*Med. Contemporanea.* 1917. Dec. 23. Vol. 35. No. 50. pp. 393–397.

A University thesis containing a study of the bacillus isolated from a case of dysentery. No particulars are given of the case, which is

stated to have been the first in Portugal in which a dysentery bacillus has been isolated. The organism was taken through the sugars and otherwise examined in the laboratory, and gave identical results with two strains of the Shiga bacillus, one of which was obtained from London and the other from Prague. It agglutinated up to 1 in 1,000 with a Shiga serum obtained from Berne.

J. B. Nias.

MIDA (M.). **[A Dysentery-Like Organism called "Fukuoka Paradysentery A and B" isolated from Certain Cases of Dysentery in Infants.]**—*Saikingaku Zasshi* (*Jl. Bacteriol.*). 1917. Mar. 15. No. 258. pp. 173–237.

[From Review by R. G. MILLS.]

The author has treated 21 cases—dysentery in children in whom the causal organism has been isolated and found to be practically identical. The bacilli could be plated out from the faeces as late as 13–16 days after the onset and were often as numerous on an Endo plate as the colon bacilli. The pathogenicity of the organism was assumed on the basis of the agglutination reactions and the pathogenicity for animals wherein it closely resembled the dysentery bacilli. The reactions were :—

X bacilli—homologous serum (patients serum) 7th-8th day, 1–80 or 1–100; in 2–3 weeks, 1–300 or 1–500, rarely 1–1,000.

X bacilli—heterologous serum (another patient's serum), same.

X bacilli—dysentery serum, 1–20, rarely 0.

X serum—dysentery bacilli, 1–20, rarely 0.

X serum—*B. coli*, 1–10, 1–20, or 0.

X bacilli—typhoid serum, 0.

X bacilli—paratyphoid serum, 0.

X bacilli—normal serum, 0.

Unusual phenomenon.—It was stated that X bacilli could restrain the agglutination of other forms in the lower dilutions of serum, but was unable to do so when more dilute.

Complement fixation.—The antigen for this and other related organisms was prepared by suspending the bacteria in distilled water, heating to 60° C. for 15–20 hours, agitating for 48 hours, centrifuging and preserving the supernatant liquid. This was diluted to 5 per cent. for use. The complement was 2 per cent. guinea-pig blood and the serum was inactivated for 30 minutes at 58° C. Results.—Both strains were found to bind complement interchangeably, no action was noted with the use of a dysentery antigen prepared with the different strains and none with these sera and x antigen.

Morphological characters.—The size is slightly larger than that of the dysentery bacillus, the ends are rounded, and they usually occur singly, rarely in strings. They are non-motile and stain readily with the ordinary aniline dyes and Giemsa, often showing a decided bipolar tendency.

Culturally the growth on potato is denser than that produced by the Shiga bacillus and less than formed by *B. coli*. The form of the colonies on the agar plate is thought to be characteristic in its pleomorphism. The usual form is circular or semicircular but a certain proportion of the colonies are U shaped. This unusual shape is more

noticeable in those which have been subcultured several times than on the first plating from the faeces. The organism grows readily at room or incubator temperature in weak alkaline solutions. In gelatin and 5 per cent. dextrose agar stabs the growth is good but without the formation of gas. In peptone solution there is medium cloudiness and no pellicle. Indol is produced in 5 days in a 1 per cent. solution. Milk is coagulated after 1–2 weeks the process beginning at the bottom of the tube and extending gradually upward. In litmus media there is an initial redness the first day which turns to blue for 2–3 days and then back to red again. Acid but no gas is produced from dextrose, maltose, saccharose lactose and dextrin.

Animal inoculation.—Living as well as dead cultures of X are quite toxic to rabbits and guinea-pigs, especially young ones. Successful passage however increases the toxicity somewhat, the organisms reaching the intestine after a subcutaneous injection and the bacteria being recoverable from any of the internal organs after death.

Clinically the cases were indistinguishable from the ordinary form of dysentery. Autopsy on 5 of the 21 cases that died gave noticeable changes in the intestines, following swelling with superficial erosion, and great oedema and hyperemia of the entire colon. In a few places there was a tendency to pseudomembrane formation. The faeces were full of purulent bloody mucus. Three photographs of colonies and agar plates illustrate the shape of the growth; a drawing of a cross section of the intestines shows the formation of the pseudomembrane, and a fifth plate delineates the arrangement of the fibrin threads in the exudate in the colon.

F. E. T.

LEVI DELLA VIDA (Mario). **Alcune osservazioni sulla dissenteria bacillare nelle popolazioni del Bellunese e Trevigiano.** [Some Observations on Bacillary Dysentery in the Population of the Provinces of Belluno and Treviso].—*Giorn. di Med. Milit.* 1917. Dec. 31. Vol. 65. No. 12. pp. 1018–1026.

Bacillary dysentery has increased since 1912 in the provinces of Belluno and Treviso in Northern Italy, where it occurs both sporadically and as small epidemics. Using Endo and Drigalski (with and without crystal violet) for plating the stools the only dysentery bacillus that the author has succeeded in isolating is the Shiga-Kruse bacillus, the only other organisms obtained being *B. coli communis* and *communior* and various non-lactose fermenters, such as the *B. metacoli* or *paracoli* of Jensen and Bahr, various types of B. Morgan, etc.

F. E. T.

HUNZIKER. **Ueber bazilläre Ruhr.** [On Bacillary Dysentery.]—*Correspondenz-Blatt f. Schweizer Aerzte.* 1917. Sept. 22. Vol. 47. No. 38. pp. 1226–1232.

In recent decades Switzerland has been free from dysentery but in August 1917 it was made a notifiable disease throughout the whole country, on account of the danger of its introduction from the combatant troops and civil population of neighbouring countries. An

instance of this occurred in September 1916. An old lady of 64, coming from abroad, visited her interned son in a prisoner-of-war camp in the Bernese Oberland after a five days journey. On the night of her arrival a severe attack of dysentery commenced, ending fatally in ten days. Dysentery bacillus Y was isolated from the stools shortly before death. The attendant physician, nurse and son of the patient were all infected but recovered and from the stools of two of them Flexner's bacillus and the Y bacillus were isolated.

An account is then given of the course, diagnosis, progress, treatment and prophylaxis of dysentery to supplement the text book descriptions which constitute the only knowledge of the disease possessed by the majority of Swiss physicians.

F. E. T.

VON FRIEDRICH (Ladislaus). **Zur Epidemiologie der Shiga-Kruse-Dysenterie.**—*Deut. Med. Woch.* 1917. Dec. 20. Vol. 43. No. 51. pp. 1585-1587. With 3 charts.

The author records a small epidemic of dysentery in the soldiers of a fortress, the disease being introduced by the cook, who while purchasing foodstuffs came in contact with the civil population amongst whom sporadic cases of dysentery had occurred. Either by bacteriological examination of the stools or by agglutination the outbreak was shown to be due to the Shiga-Kruse bacillus. The symptoms were not severe and no deaths occurred. Recurrences in which the symptoms were less severe than the original attack were observed in five cases.

F. E. T.

i. UMBER. **Krankheitsbild und Behandlung der Ruhr im Heimatgebiet. I. Klinischer Teil.** [Clinical Picture and Treatment of Dysentery in Germany.]—*Deut. Med. Woch.* 1917. Dec. 6. Vol. 43. No. 49. pp. 1521–1524.

ii. FRIEDEMANN (U.). **II. Bakteriologie der Ruhr.** [Bacteriology of Dysentery].—*Ibid.* pp. 1524–1525.

i. Dysentery, usually of the milder type, has made its appearance during the summer in Berlin and northern Germany. The complications and sequelae which have been observed include toxic disturbances of the heart muscle and of the vessels, leading to oedema, rheumatoid diseases, which occurred in the second week of the disease in 2–7 per cent. of the cases, conjunctivitis, according to STARCK the commonest of the complications, the less frequent keratitis and irido-cyclitis, toxic neuritic disorders of the nervous system and achylia. The various remedies for dysentery are critically considered, and the author is sceptical as to the value of the serum treatment, and states that in six different factories in Germany no less than 13 different anti-dysenteric sera are prepared.

ii. In the hands of Friedemann examination of the stools for dysentery bacilli has given disappointing results. By obtaining mucus direct from the sigmoid flexure by means of the proctoscope and plating direct on plain agar instead of on Conradi-Drigalski agar, with or without crystal violet, Friedemann has obtained the Shiga bacillus in every one of a series of 16 cases. From his bacteriological and serological experiences the author is convinced that the cause of

epidemic haemorrhagic colitis is to be exclusively found amongst the recognised dysentery bacilli.

The course and mortality were compared in 100 cases treated by a polyvalent Shiga serum in doses of 80 to 200 cc. intravenously and intramuscularly, and 95 equally severe cases untreated with serum as controls. Statistically no proof of the value of the serum could be obtained either in lessening the mortality or in diminishing the duration of the disease. F. E. T.

BENEKE (R.). **Zur Pathogenese, Behandlung und Prophylaxe der epidemischen Ruhr.** [The Pathogenesis, Treatment and Prophylaxis of Epidemic Dysentery.]—*Münch. Med. Woch.* 1917. Sept. 25. Vol. 64. No. 39. pp. 1277–1278.

The author rejects the commonly accepted opinion, that the mouth is the usual portal of entry of the infecting organism in epidemic dysentery, by means of infected food, water, etc. He points out that dysentery bacilli are extremely sensitive to acid and would ordinarily be killed by the acid gastric juice unless pathological conditions were present diminishing the acidity of the gastric juice, such as gastric catarrh, or the bacilli were present in enormous numbers as to pass through the stomach undamaged. Beneke advocates the view that the invasion of the large intestine by dysentery bacillus is via the anus. He considers that a consideration both of the pathologico-anatomical and the clinical facts supports this view and that the disease begins in the rectum and gradually ascends as an ascending colitis to the caecum.

The anus may be directly infected by contact with the fingers, toilet paper, etc., or the bacilli may exist for long periods in the moist skin of the perineal cleft and so infect the anus.

In the treatment of the disease early topical applications should be applied to the rectal mucous membrane, and as a prophylactic measure the bacilli living on the moist skin of the perineal cleft should be destroyed by suitable antiseptic procedures. F. E. T.

SCHMITZ (K. E. F.). i. **Ueber einen bisher noch nicht bekannten Krankheitserreger aus der Dysenteriegruppe.** [A hitherto Unknown Disease-Producer in the Dysentery Group.]—*Münch. Med. Woch.* 1917. Dec. 4. Vol. 64. No. 49. pp. 1571–1572.

ii. **Ein neuer Typus aus der Gruppe der Ruhrbazillen als Erreger einer grösseren Epidemie.** [A New Type of Dysentery Bacillus as the Cause of a Large Epidemic.]—*Ztschr. f. Hyg. u. Infektionskr.* 1917. Dec. 9. Vol. 84. No. 3. pp. 449–516. With 2 plates.

In a large camp containing many thousands of prisoners an epidemic of dysentery occurred in January-February 1917 in which 10 per cent. of the prisoners were attacked. The epidemic was of a mild character. An organism was isolated and held responsible for the disease which presented characters different from all the known members of the dysentery group.

Culturally it differed from the pseudo-dysentery group in fermenting mannite and from the Shiga-Kruse bacillus in the abundant formation of indol. Serologically, the new bacillus was not agglutinated by high

titre dysentery sera and the serum obtained after injection with this organism, although powerfully agglutinating the new bacillus, only agglutinated the other dysentery bacilli in very low titre. Further the independent position of the new bacillus was proved by the results of CASTELLANI'S saturation test.

The new bacillus, to which ABEL has given the name of the bacillus Schmitz, must be considered to be the causal agent of the epidemic since it was only found in the typical stools and also agglutinated the serum of patients in high dilution. That the bacillus Schmitz belonged to the group of dysentery bacilli was proved by the character of the epidemic, the co-agglutination with Shiga-Kruse, the absence of flagella and motility, and by the typical dysentery smell of the cultures. The bacillus Schmitz occupies a mid-position between the recognised groups of dysentery bacilli, and belongs to a new group further members of which will probably be brought to light in the future

F. E. T.

PŘIBRAM (Ernst). **Ueber Dysenterietoxin und Dysenterieantitoxin. I. Ein bisher unbekanntes Dysenterietoxin in den mannitvergärenden Stämmen A-H von Kruse.** [Dysentery Toxin and Dysentery Antitoxin. I. A Hitherto Unknown Dysentery Toxin in Kruse's Mannitefermenting Strains A–H.]—*Cent. f. Bakt.* 1. Abt. Orig. 1917. Aug. 30. Vol. 80. No. 1–3. pp. 33–40.

Přibram found that bouillon culture filtrates of the mannite-fermenting strains of dysentery bacilli were strongly toxic to goats in intravenous injection, less so to rats in intraperitoneal injection, but were non-toxic to guinea-pigs either by intravenous or intraperitoneal injection. The toxicity of these filtrates appeared to be parallel to that of the cultures themselves. It was best obtained in broth containing 6 cc. of N-soda solution after neutralisation to litmus.

By injecting increasing doses of the toxin an antitoxin could be produced which completely protected against intravenous injection of the toxin. The antitoxin obtained by injecting the Shiga-Kruse toxin was ineffective against one of Kruse's D strains.

F. E. T.

MARTIN (C. J.) & WILLIAMS (F. E.). **Types of Dysentery Bacilli isolated at No. 3 Australian General Hospital, Cairo, March-August, 1916, with Observations on the Variability of the Mannite Fermenting Group.**—*Jl. of Hygiene.* 1917. Dec. Vol. 16. No. 3. pp. 257–268.

Attempts to isolate dysentery bacilli from 217 cases occurring amongst Australian troops of the E. E. F. in which the stools contained muco-pus with or without blood yielded the following results:—

Amoeba histolytica or cysts present	63
B. dysenteriae Shiga isolated	47
Mannite fermenting (agglutinated at time of isolation by Y serum)	64
Dysentery bacilli (not agglutinated at time of isolation by Y serum)	12
No causative organism recovered	36
Total	222

In five instances dysentery bacilli were isolated from patients with amoebic infections.

The biochemical activities of forty-nine strains of the mannite fermenters were investigated immediately after isolation and again six months later. They showed variability as regards the fermentation of maltose, saccharose, dextrin, arabinose, isodulcite, sorbite and glycerin and in the formation of indol. The same strain varied at different times, some gaining, others losing one or other of these properties.

The authors consider that the separation of the mannite fermenting dysentery bacilli into groups on the ground of their action on the above carbohydrates is unsound and that the only carbohydrates of service for their identification are glucose, mannite, lactose, and dulcite. In one strain the fermentation of saccharose was found to be a " recessive character " and only maintained by artificial selection. One sixth of the mannite fermenting dysentery bacilli isolated were not agglutinated by a univalent Y serum at the time of isolation, but half of these acquired this property by cultivation. In one strain agglutinability to Y serum was lost under prolonged cultivation on saccharose peptone media, and was rapidly regained by propagation in broth.

The authors conclude that no one univalent serum will agglutinate all dysentery bacilli of the mannite fermenting type and that a bacillus with the morphological, cultural and biochemical characters of dysentery bacilli of this type is not discredited as an etiological factor because it is not agglutinated by any particular univalent serum.

F. E. T.

D'Hérelle (F.). **Sur un microbe invisible antagoniste des bacilles dysentériques.**—*C. R. Acad. Sci.* 1917. Sept. 10. p. 373.

From the stools, and in one case the urine, of convalescents from bacillary dysentery the author claims to have obtained growths of an ultra-microscopic organism which passes through a Chamberland L2 filter, and destroys the Shiga bacillus by lysis. This anti-Shiga microbe possesses no pathogenic action for experimental animals, but will immunise the rabbit against a fatal dose of Shiga's bacillus.

d'Herelle considers this organism to be a veritable microbe of immunity, an obligate bacteriophage, with strictly specific parasitism. He believes that the production of a heterologous anti-microbic immunity by an ultra-microscopic antagonistic micro-organism may not be confined to dysentery, but may be a more general phenomenon as he has also observed a similar, though less marked condition in two cases of para-typhoid fever.

F. E. T.

Beintker. **Ueber Paragglutination bei Ruhr.** [Para-Agglutination in Dysentery.]—*Deut. Med. Woch.* 1917. Nov. 15. Vol. 43. No. 46. pp. 1446–1447.

The author reports a case of dysentery in which an organism was recovered from the stools which gave the cultural characters of

B. paratyphosus B, but agglutinated dysentery Y serum, but not that of *B. paratyphosus* B or any other member of the typhoid-coli group; thus :—

Serum dilution	Typhosus 1/1000	Para-typhosus A 1/1000	Para-typhosus B 1/1000	Shiga 1/500	Y 1/1000	Gartner 1/1000
No. 769	—	—	—	—	++	—

F. E. T.

HOLLANDE (A. Ch.) & FUMEY (M.). **Emploi de l'ovalbuminate de soude et des papiers réactifs tournesolés sucrés dans la différenciation des bacilles dysentériques : gélification de l'alcali-albumine.**—*C. R. Soc. Biol.* 1917. Nov. 10. Vol. 80. No. 17. pp. 835–839.

The authors employ for the differentiation of dysentery bacilli an aqueous solution of ovalbuminate of soda to which is added the selected sugar, litmus being employed in the form of litmus papers. Saccharose, glucose, lactose, mannite and maltose suffice for the differentiation of the dysentery bacilli; and the fermentation reactions may be arranged in tabular form, thus :—

	Glucose	Mannite	Saccharose	Maltose	Lactose
Shiga	A	—	—	—	—
Hiss	A	A	—	—	—
Strong	A	A	A	—	—
Flexner ..	A	A	A	A	—

The reactions of the fermented sugars are shown by change in colour of the litmus paper, coagulation of the medium and by decolorisation of the liquid due to the production of a leucoderivative of the litmus.

F. E. T.

MICHAELIS (L.). **Ueber kombinierte Eiweiss-Säureagglutination, insbesondere zur Unterscheidung von Koli- und Ruhrbazillen.** [Combined Albumen-Acid-Agglutination, with Reference to the Differentiation of Colon and Dysentery Bacilli.]—*Deut. Med. Woch.* 1917. Nov. 29. Vol. 43. No. 48. pp. 1506–1507.

Michaelis has previously described the acid agglutination of typhoid and paratyphoid bacilli, each organism possessing its own acid agglutination optimum. Colon and dysentery bacilli show no acid agglutination. On the addition of even a trace of any albuminous substance, for example a small quantity of strongly diluted blood serum, the phenomenon of acid agglutination is shown by the colon bacillus, but not by dysentery bacilli. Michaelis considers it probable that a positive albumen-acid-agglutination is a group reaction for colon bacilli and that a negative albumen-acid-agglutination is a group reaction for dysentery bacilli.

F. E. T.

NOWICKI (Witold). **Ueber das kombinierte Verfahren bei der Untersuchung der Typhus-, Paratyphus- und Ruhrstühle.** [On the Combined Procedure in the Examination of Typhoid, Paratyphoid and Dysentery Stools.]—*Wien. Klin. Woch.* 1917. Sept. 20 & 27. Vol. 30. Nos. 38 & 39. pp. 1204–1206; 1240–1244.

The author points out the unsatisfactory results usually obtained in the examination of typhoid, paratyphoid and dysentery stools, both by direct plating and by the use of indirect methods. He considers that methods of enrichment are preferable to methods of inhibition, especially in the examination of typhoid stools. The best results are obtained by a combination of direct plating with indirect methods. For typhoid and paratyphoid direct plating combined with the use of bile media is best, a combination with the pretoleum ether method being unsatisfactory. The petroleum ether method is quite unsuitable for dysentery stools, in which a combination of direct plating with the normal saline method, allowing an exposure of six hours, gives the best results. Hence in examination of the stools for all three organisms direct plating combined with bile media and the normal saline method should be employed.

F. E. T.

GASSNER-Rostock (G.). i. **Metachromgelb als Hemmungsmittel für Kokken und Sporenbildner und seine Verwendbarkeit für Nährböden zur Typhus-Ruhrdiagnose.** [Metachrome Yellow as Inhibitor of Cocci and Spore-Formers and its Applicability in the Diagnosis of Typhoid and Dysentery.]—*Cent. f. Bakt.* 1. Abt. Orig. 1917. Aug. 30. Vol. 80. No. 1–3. pp. 120–127.

ii. **Ein neuer Dreifarbennährboden zur Typhus-Ruhr-Diagnose.** [A New Three Colour Culture Medium for the Diagnosis of Typhoid and Dysentery.]—*Ibid.* Nov. 15. No. 4. pp. 219–222.

i. Gassner found that the addition of 0·1 per cent. of metachrome yellow II R D to feebly alkaline culture media completely inhibited the growth of cocci and spore-forming bacilli, but had no influence on the growth of typhoid and dysentery bacilli or on the agglutinability of these organisms.

ii. He recommends the addition of 125 cc. of 2 per cent. metachrome yellow solution and 175 cc. of 1 per cent. water-blue solution plus 100 gm. lactose to 2 litres of feebly alkaline yeast water or agar for the examination of stools for typhoid and dysentery bacilli. The medium is green, prevents the growth of cocci and spore-bearing bacilli, and has no influence on the growth of typhoid and dysentery bacilli or on their agglutinability. Coli colonies are opaque and have a blue surround, typhoid and dysentery bacilli are translucent and have a yellow surround. These colour changes are equally visible by transmitted and reflected light and by natural and artificial light.

F. E. T.

VON DARÁNYI (Julius) & STRANSKY (Eugen). **Beobachtungen über Schutzimpfung bei Ruhr.** [Observations on Protective Inoculation in Dysentery.]—*Wien. Klin. Woch.* 1917. Nov. 8. Vol. 30. No. 45. pp. 1424–1425. With 1 chart.

An epidemic of dysentery occurred in July-August 1917 in the military prison at Arad [Hungary]. The whole of the prisoners—

about 800 in number—were then given two injections of 1 cc. of a Shiga-Kruse vaccine at five days interval. Although the mortality for the whole epidemic was 14·5 per cent. in spite of intensive serum treatment, no further fatal case occurred after the inoculations were given and in four days time (three days being allowed as the incubation period of dysentery) the epidemic was brought to an end.

F. E. T.

FICKLER (Alfred). **Ruhrschutzimpfungen mit dem Impfstoff von Ditthorn und Loewenthal.** [Protective Inoculation with the Vaccine of D. & L.]—*Münch. Med. Woch.* 1917. Dec. 11. Vol. 64. No. 50. pp. 1600–1601.

As the result of injecting 800 persons the author considers that protective inoculations with the vaccine of DITTHORN and LOEWENTHAL [see this *Bulletin*, Vol. 11, p. 59] are free from danger. Local reactions are trivial, a rise of temperature occurring in 20–25 per cent. of the cases inoculated. Protection against dysentery is secured which lasts more than two months.

F. E. T.

MIXED AND UNCLASSED DYSENTERY.

HURST (A. F.). **Dysentery; Clinical Lecture.**—*Guy's Hosp. Gaz.* 1917. June 30 & July 14. Vol. 31. Nos. 756 & 757. pp. 243–249; 261–266.

The first lecture deals with amoebic dysentery, WENYON's description of the *Entamoeba histolytica* being closely followed and his opinion that flies are the most important means of spreading the disease being given. Hurst considers that the stools of convalescent and contact carriers are a more fertile source of infection than those of patients suffering from dysentery. As regards treatment, gr. 1 of emetine hydrochloride should be injected subcutaneously once daily for twelve days. In very severe cases gr. ½ to 1 dissolved in 5 cc. of normal saline solution should be injected intravenously and in less severe cases gr. 1 can be given subcutaneously as long as may be necessary, but there should be an interval of a few days after each period of twelve days. If any blood or mucus reappears in the stools gr. 1 of emetine hydrochloride should be injected every night for six nights. Since the treatment has become so much more effective as a result of using emetine subcutaneously Hurst considers that neither appendicostomy nor any other operation ought ever to be necessary.

The second lecture deals with bacillary dysentery. The dysentery which has always been common among armies during war time was most probably bacillary and not amoebic. The bacillary dysentery in the Mediterranean Forces and on the Eastern Front was chiefly caused by Shiga's bacillus, and that on the Western Front by Flexner's and the Y bacillus, although in the summer of 1916 isolated outbreaks of Shiga infection were recorded, probably as a result of infection brought by troops who had previously fought at Gallipoli.

In fulminant cases the suprarenal glands show congestion and necrosis, and death may endure from suprarenal insufficiency. Arthritis involving one or more of the large joints, whilst common in the British troops in the South African war, has been comparatively rare in the present war. The knee is most often affected, there being much effusion which does not suppurate, the disease bearing some resemblance to gonococcal arthritis.

The specific treatment of bacillary dysentery consists of anti-dysenteric serum administered intravenously, from 40 to 100 cc., depending on the severity of the case, and the dose may be repeated daily for ten or more days if necessary. Saline aperients are of value only in bacillary dysentery. Unless the patient is seen on the first day when the initial dose should be omitted, ½ oz. of sodium sulphate in saturated solution should be given at the outset, followed by drachm doses every four hours during the first day and then every six hours until the dysenteric character of the stools disappears. The local treatment consists of enemata of tannic acid (gr. 4 to the ounce), one and a half pints of fluid at 100° F. being slowly run into the rectum. The enemata should be repeated daily or on alternate days between three and five times and the series can, if necessary, be repeated after a week's interval. A persistent infection with *B. dysenteriae* or *B. paratyphosus* should be treated by autogenous vaccines.

F. E. T.

KRUSE. **Ueber die Veränderlichkeit der Seuchen, insbesondere des Typhus und der Ruhr.** [The Variability of Epidemic Diseases, especially Typhoid and Dysentery.]—*Münch. Med. Woch.* 1917. Oct. 2. Vol. 64. No. 40. pp. 1309–1311.

The author discusses the question as to whether epidemic diseases have undergone any change in character during the course of time and points out how the war has provided many examples of this change. He contrasts the small epidemic of small-pox which occurred in Germany last year, with the great outbreak of this disease during the war of 1870 to 1871 and with its characters and prevalence in pre-Jennerian times. Typhoid as well as paratyphoid fever has also been modified by the adoption of prophylactic vaccination in the army. Dysentery has also been differentiated in recent years into the two forms amoebic and bacillary, the latter being due to true dysentery bacilli and to the so-called pseudo-dysentery bacilli. Before the war Kruse had differentiated the so-called pseudo-dysentery bacilli into various strains or types, naming them A to H, and during the war two further strains named I and J have been encountered. Lastly he discusses the question of the "Mutation" of bacilli, especially of coli and dysentery bacilli. Laboratory strains kept for many years have shown variations in agglutinability, in power to ferment mannite and maltose, and in virulence, but the change of dysentery to pseudo-dysentery bacilli, or change of one strain of the latter to another has never been observed.

F. E. T.

UMNUS (O.). **Ruhr und ruhrähnliche Erkrankungen.** [Dysentery and Dysentery-Like Diseases.] — *Ztschr. f. Immunitätsf. u. Exper. Therap.* 1. Teil. Orig. 1917. Vol. 26. No. 1. pp. 83–96.

Umnus thus classifies cases of infective colitis :—

Disease.	Cause.
1. Dysentery	*B. dysenteriae*, Shiga-Kruse.
2 Paradysentery .. ,, ..	(a) 1. Type Y.
	2. ,, Flexner
	3. ,, Strong
	4. ,, Aronson, etc.
	(b) Strains A-H Kruse
3. Colitis haemorrhagica	Without specific cause

In the recognition of the causal organism it is necessary to investigate all its characters—biological (cultural and serological) and morphological, its virulence, motility and staining powers. Agglutination is not sufficient for diagnosis, as the occurrence of co- and para-agglutination may lead to error. The Widal reaction gives better results in dysentery than in para-dysentery. The use of serum is not recommended, which is not surprising seeing that it was only given in doses of 10 to 20 cc. subcutaneously.

F. E. T.

HEINRICHSDORFF. **Bemerkungen über Ruhr.** [Remarks on Dysentery.] —*Med. Klinik.* 1917. Mar. 4. Vol. 13. No. 9. pp. 242–243.

This paper records the author's personal impressions of dysentery in a field hospital on the Eastern Front. A sudden onset with rigors, headache and vomiting was observed in many cases. The temperature chart was not characteristic—irregular remittent pyrexia being most commonly observed. In many cases the strongly remitting pyaemic form of temperature chart was seen. Although the intestinal symptoms dominated the clinical picture in the majority of the cases, in some the signs of general toxaemia predominated. Damage to the renal epithelium by the toxin produced albuminuria with hyaline and granular casts in the urine, seldom red blood corpuscles. The toxin acting on the liver produced jaundice, and on the spleen enlargement of that organ. An urticarialike erythema, herpes labialis, petechiae, hiccough, laryngeal paralysis, bradycardia and arthritis were all observed. The mortality was 2 per cent. Positive agglutination was obtained in 80 per cent. of the cases, most frequently with Flexner's bacillus, almost as frequently with the Y bacillus, least frequently with Shiga's bacillus. The agglutination titre was extremely variable, more than one organism being usually agglutinated by the same serum. The Flexner and Y bacilli were most frequently agglutinated together. In many cases the agglutination was alternately positive and negative in the same patient at different times.

Anatomically the disease appears to commence in the large bowel as a haemorrhagic inflammation (Colitis haemorrhagica). The mucous membrane becomes necrotic (Colitis necroticans), separated (Colitis

pseudo-membranacea) and finally cast off (Colitis ulcerosa). In other cases it appears to be a Colitis fibrinosa.

Death in the acute stage results from toxaemia, in the subacute and chronic from anaemia, inanition and diffuse peritonitis.

F. E. T.

GASBARRINI (Antonio). **Sull' etiologia di alcune diarree dissenteriformi fra le truppe combattenti.** [Dysenteric Types of Diarrhoea among Italian Troops.]—*Policlinico.* Sez. Med. 1917. Nov. 1. Vol. 24. No. 11. pp. 429–441. With 1 text-fig.

The author has been able to identify three types of dysenteric diarrhoea occurring in troops returning from the Italian front.

1. Due to *B. paratyphosus* A. The serum of patients reacted with this bacillus in a dilution of 1 : 200. A positive haemoculture was also obtained in one case. An autopsy of one case that died showed typical lesions in the Peyer's patches and solitary glands of the small intestine, and in the large intestine.

2. A mixed type characterized by great anaemia. The sera of patients agglutinated *B. paratyphosus* A and also B. Shiga-Kruse, the former in a dilution of 1 : 200, and the latter in a dilution of 1 : 250. Three autopsies were obtained in this class of case, all of which showed extensive ulceration of the colon, sigmoid flexture, and rectum, with lesions of Peyer's patches, etc. as in the first type.

3. A more benign type, showing tenderness and swelling of the sigmoid flexure clinically, with muco-sanguinolent diarrhoea. The autopsy of a fatal case revealed ulceration limited to this region. Serum and bacteriological tests in this class of case gave negative results.

J. B. Nias.

FIESSINGER (Noël) & LEROY (Edgar). **Contribution à l'étude d'une épidémie de dysenterie dans la Somme (juillet-octobre 1916).**—*Bull et Mém. Soc. Méd. Hôpit. de Paris.* 1916. Dec. 21. 3 Ser. Vol. 32. No. 35–36. pp. 2030–2069. With 5 charts.

During the course of the military operations on the Somme from July to October 1916 epidemics of amoebic, bacillary, and mixed amoebic and bacillary dysentery occurred. The chief characters of these epidemics were the wide diffusion and benignity of the cases, due no doubt to the extreme mobility of the bodies of troops and the good physical condition of the soldiers attacked.

The amoebic dysenteries numbered 12. Relapses were rare. In one case an abscess of the liver was cured by emetine. There were three deaths, from multiple abscess of the liver, perforation of the colon, and pulmonary embolism following iliac thrombosis respectively. Amoebic cysts were present in 58 cases. The cysts were passed intermittently. The cases were mostly benign and of short duration. Eight were prolonged and febrile. Emetine was always efficacious.

The mixed amoebo-bacillary forms numbered 26. The amoebae and bacilli seemed to associate their pathogenic action, so that the

cases were severe and prolonged. In three cases paratyphoid A was associated with amoebic cysts.

The bacillary dysenteries numbered 84 and were diagnosed by cultures from the stools and agglutination, these two methods supplementing each other. These cases were usually benign. Twelve were prolonged and seven were febrile. In three cases paratyphoid A or B was also isolated. The authors insist on a conjunctivo-urethro-synovial syndrome simulating a gonococcal syndrome and also a choleriform syndrome.

In 27 cases no organism was found and the cases remained unclassed.

Therapeutically, emetine was always successful in the amoebic cases, whilst the serum gave only mediocre results in the bacillary forms.

The association of the two types of dysentery—amoebic and bacillary—completely changed the general physiognomy of the epidemic and rendered particularly difficult and complex both the clinical and laboratory diagnosis.

F. E. T.

NOBÉCOURT (P.). **Dysenteries bacillaires et diarrhées chez des prisonniers de guerre.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1917. June 14. 3 Ser. Vol. 33. No. 19–20. pp. 764–769.

The author investigated the condition of 99 German soldiers recently taken prisoner and suffering from dysenteriform diarrhoeas, of all degrees of severity—slight, medium and severe. It was only by the appearance of the faeces that the dysentery cases could be distinguished from the diarrhoeas. Neither dysenteric amoebae nor cysts were discovered in any case.

From cultures from 21 dysenteric stools Flexner's bacillus was recovered in 2 cases and the Hiss bacillus in 5 cases, whilst in cultures from 32 diarrhoeal stools Flexner bacillus was obtained once and Hiss 7 times, three of which did not agglutinate the experimental Flexner serum.

In 18 agglutination tests with the blood of dysentery patients positive results were obtained in 4 cases, namely, 3 with Flexner (in one of which Flexner's bacillus was found in the stool) and one (whose stool contained the Hiss bacillus) with both Shiga and Flexner. In 31 agglutination tests of the diarrhoea cases 2 positive results were obtained, namely one (whose stools were not examined) with Flexner and one (whose stool contained the Hiss bacillus) with both Shiga and Flexner.

As regards anti-dysenteric serum the mortality was greater amongst those to whom the serum was administered than amongst the remainder, In the case of the dysentery patients administration of the serum produced a rapid improvement in the symptoms, although in nearly all a banal diarrhoea persisted for a long time. On the other hand the symptoms manifested by the diarrhoea cases did not appear to be in any way influenced by the administration of the serum.

F. E. T.

SADLER (Wilfrid) & KELSO (R. F.). **An Epidemic of Acute Diarrhea approaching in some Cases a Mild Dysentery.**—*Jl. Infect. Dis* 1917. Feb. Vol. 20. No. 2. pp. 140–144.

This epidemic occurred in February and March 1917 around St. Anne de Bellevue, Quebec. The majority of cases occurred among women students, the worst cases occurring amongst those whose resistance was low. Clinically the cases were classified into simple diarrhoea, dysenteric diarrhoea and mild dysentery. There was no mortality. Samples and stools of six patients were examined bacteriologically—organisms with the following reactions were isolated.

Strain	Glucose	Lactose	Saccharose	Maltose	Mannite	Indol.
Shiga ..	..	..	—	—	—	—
Flexner ..	..	..	+	+	+	+
Y (Hiss) ..	..	..	—	—	+	—
Strong ..	..	..	—	+	+	..
Sample B ..	+A	+A	+A	+A	+A	—
Sample C ..	+A	+Alk	+Alk	+A	+A	+
Sample D ..	+A	+Alk	+Alk	+Alk	+A	—
Sample F ..	+A	+A	+A	+A	+A	—

The authors suggest that both acute diarrhoea and dysentery, occurring in the same epidemic, may possibly be due to some variation of the same causal organism. This is the first time that the Shiga group has been isolated so far north as Canada. Their studies indicate that we have a *B. dysenteriae* group analogous to the *B. coli* group.

F. E. T.

GRAHAM (Duncan). **Some Points in the Diagnosis and Treatment of Dysentery occurring in the British Salonika Force.**—*Lancet.* 1918. Jan. 12. pp. 51–55.

This account is based on the examination of over 2,500 cases suffering from dysentery or diarrhoea. Three per cent. or less of the dysentery occurring in this area was of the amoebic type and was cured by the double iodide of bismuth and emetine. Bacteriological examination showed the *B. dysenteriae* Shiga to be the commoner infecting agent in the more severe cases, and *B. dysenteriae* Flexner Y in the milder cases.

In the Salonika Forces stools in the blood and mucus stage of bacillary dysentery were sufficiently characteristic to diagnose the case "clinical bacillary dysentery" and to treat it as such. In faecal stools the presence of cellular mucus in which pus cells predominate or of small groups of pus cells was sufficient to warrant the same diagnosis. A fair percentage of the cases admitted to hospital as simple diarrhoea was a mild form of recurrent bacillary dysentery. That intestinal flagellates produce a dysentery or even simple diarrhoea was not proved. The prevention of dehydration of the tissues by the injection of intravenous salines was of primary importance, and intravenous injections of antidysenteric serum in doses of 60 to 80 cc. were given once or twice daily the first three days with the best results.

F. E. T.

MELLANBY (Edward). **Diagnosis and Treatment of Dysentery occurring in the British Salonika Force.** [Correspondence].—*Lancet.* 1918. Jan. 26. p. 162.

Mellanby considers the results obtained by GRAHAM to be remarkably good [see above], and claims that his (Mellanby's) "Experimental Investigation on Diarrhoea and Vomiting of Children" published in the *Quarterly Journal of Medicine* Vol. 9, April, 1916, gave support from laboratory and animal observations for the treatment of these cases.

He further considers that the importance of the maintenance of the body fluids to normal or above normal in dysenteric cases is now proved both experimentally and clinically, and would also call attention to the part played by diminished body fluids in the onset of these infections, as well as to extreme toxity of the products of the alimentary canal mucous membrane, such as β-imida-zolyl-ethylamine, the formation and liberation of these toxic substances being only influenced to a small extent by bacteria, and these non-specific.

F. E. T.

FLORAND (A.) & BENSAUDE (R.). **Etude radiologique des lésions recto-coliques dans la dysenterie.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris*, 1917. Aug. 2. 3 Ser. Vol. 33. No. 25–26. pp. 963–970. With 9 text-figs.

By employing the method of opaque lavage in the radiological examination of the lesions in the large intestine in cases of dysentery the authors have observed the slight degree of opacity presented by the affected segments, which sometimes appear to be quite empty, as well as the shrunken and atrophied condition of the rectal ampulla and of the sigmoid flexure of the colon.

F. E. T.

HOWELL (Aldred). **The Convalescence of Dysentery and its Complications.**—*Practitioner.* 1917. May. Vo . 98. No. 5. (No. 587). pp. 419–426.

Among 200 convalescent cases of dysentery from Gallipoli admitted to the Third Western General Hospital, Cardiff, during the winter of 1915–16 the following complications were observed :—

Gastro-intestinal.—The pre-suppurative stage of amoebic hepatitis in one case; severe constipation, three cases; persistent diarrhoea probably nervous in origin was also noted.

Cardio-vascular.—Anaemia, 13 cases. Slight cardiac dilatation with normal blood pressure was common.

Nervous system.—Peripheral neuritis, 3 cases.

Arthritis.—Arthritis of knee joints, 2 cases; so-called rheumatism 16 cases.

Pneumonia.—Two cases.

Other Infections.—Enteric, 2 cases; paratyphoid B, 2 cases; paratyphoid A one case.

F. E. T.

SCHROEDER (Albrecht). **Ueber Folgezustände der Ruhr.** [The Sequels of Dysentery.]—*Deut. Med. Woch.* 1917. Sept. 13. Vol. 43. No. 37. pp. 1162–1164.

Working in a suburb of Strassburg during an epidemic of dysentery in the summer of 1916 Schroeder found achylia gastrica to be the commonest sequel. The achylia appeared to have no direct relationship to the severity of the acute bowel symptoms. It became more frequent as the disease progressed, reaching its acme during convalescence. It was encountered most frequently in Shiga-Kruse infections, and was often accompanied by other complications of toxic origin and with bradycardia. The achylia and bradycardia were apparently due to the general intoxication, the toxin circulating in the blood having a harmful effect on the stomach glands and producing bradycardia by vagus stimulation.

F. E. T.

FOGES (Arthur). **Ruhrrezidive nach Bauchoperationen.** [Dysentery Recurrences following Abdominal Operations.]—*Münch. Med. Woch.* 1917. Oct. 9. Vol. 64. No. 41. p. 1344.

Foges records three cases in which herniotomy was performed in patients who had suffered from dysentery at intervals varying from three weeks to one year previously. During convalescence from the operation the symptoms of dysentery reappeared, namely diarrhoea with blood and mucus in the stools. The bacteriological examination of the stools was negative in two cases, whilst in the third *B. dysenteriae* Flexner was obtained. The author considers that the disturbance set up by the thorough emptying of the bowel, usually by senna, in preparing the patient for operation may have provided the stimulus which provoked the recurrence of the dysentery.

F. E. T.

BRILL (E. H.). **Ruhrbehandlung mit Argentum nitricum.** [Treatment of Dysentery with Silver Nitrate.]—*Münch. Med. Woch.* 1917. Dec. 18. Vol. 64. No. 51. p. 1643.

Brill treated all his earlier cases of dysentery by injecting subcutaneously polyvalent anti-dysenteric serum with good results. His therapeutic measures then became limited and he used enemata of silver nitrate with the simultaneous administration of calomel. For the enemata he first used a dilution of 0·5 grammes in 500 cc. and increased the strength to 1 gramme in 500 cc. The mortality of the serum treated cases and those treated by silver nitrate enemata was the same, whilst a shorter convalescence was observed in the cases treated by silver nitrate, and only one case of recurrence was observed after this treatment.

F. E. T.

MARTENS. **Ueber frühzeitige Coecostomie bei Ruhr.** [Early Coecostomy in Dysentery.]—*Berlin. Klin. Woch.* 1917. Nov. 26. Vol. 54. No. 48. p. 1149.

Coecostomy and appendicostomy have long been employed in chronic dysentery, so as to evacuate the large intestine and facilitate irrigation.

Martens recommends coecostomy early in the disease for the same reasons and for the introduction of other medicaments, such as warm saline solution, bolus alba and ipecacuanha infusions, as well as antitoxic and bactericidal dysentery serum in combination with the complement contained in horse serum. The operation is free from danger, as is the subsequent closure of the fistula, which is often spontaneous.

F. E. T.

KULKA (Wilhelm). **Zur Therapie der Ruhr.** [The Therapy of Dysentery].—*Wien. Klin. Woch.* 1917. Oct. 11. Vol. 30. No. 41. pp. 1299–1300.

The author has obtained good results in the treatment of dysentery-like acute and chronic intestinal diseases by the administration of half to three quarters of a litre of Yoghurt in two or three divided doses daily and by irrigation of the bowel twice or thrice daily with 5 grammes of animal charcoal in half a litre of water or physiological saline solution, either in addition to, or in the place of, the usual remedies for dysentery.

F. E. T.

ENGEL (C.). **Ueber Bacterium Proteus and Ruhr.** [*Bacterium proteus* and Dysentery.]—*Münch. Med. Woch.* 1917. Nov. 6. Vol. 64. No. 45. pp. 1460–1462.

In a small epidemic of dysentery observed in a field lazaret a number of cases of dysentery with oedema were observed. In their stools the dysentery bacilli were seldom found (Kruse's dysentery bacillus in 2 cases, and *B. paratyphosus* B in 2 cases) whilst *Bacterium proteus* was often obtained (in 33 per cent. of the Endo plates examined as against 8 to 10 per cent. in the stools of healthy persons and patients suffering from other diseases).

In two cases in which autopsies were performed the intestinal mucosa showed an oedematous condition in addition to dysenteric changes, in which *Bacterium proteus*, but no dysentery bacilli, was found, and the tissue changes were similar to those found in experimental animal *proteus* infections.

Agglutination of *proteus* bacilli with the patients' serum did not occur, and the strains of *proteus* obtained showed biologic variations. Eugel considers that the inability to find dysentery bacilli in the stools of 4 dysentery patients is due to the fact that the little resistant dysentery bacilli are often overgrown by the other intestinal bacteria. The *Bacterium proteus* being usually a secondary invader appears to be a nosoparasite in cases of dysentery.

F. E. T.

CZAPLEWSKI. **Ueber Ruhr.** [On Dysentery.]—*Deut. Med. Woch.* 1917. Oct. 25. Vol. 43. No. 43. pp. 1347–1351. With 4 figs.

Investigating an epidemic of war dysentery in Cologne in 1917, Czaplewski was unable to find dysentery bacilli in the stools, notwithstanding the fact that clinically the condition was a typical dysentery

and the cases which died showed characteristic dysenteric lesions. An acid forming capsulated bacillus was often found which Czaplewski calls the capsulated bacillus S, and which he considers to be, not a harmless saprophyte, but a highly pathogenic and toxic organism.

F. E. T.

ABDULLA (M. M.). **Colitis in Waziristan and its Prevention.**—*Indian Med. Gaz.* 1917. Oct. Vol. 52. No. 10. pp. 347–349.

The author describes a small outbreak of colitis amongst Indian troops on active service in Waziristan. The disease was attributed to bad water and bad food. All the cases responded either to simple salines or to castor oil and were fit for duty in two or three days.

F. E. T.

ANDRUZZI (A.). **Brevi note sulla diagnosi di laboratorio delle varie forme di dissenteria.** [Short Note on the Laboratory Diagnosis of Various Forms of Dysentery.]—*Ann. Med. Nav. e Colon.* 1917. Sept.-Oct. Year 23. Vol. 2. No. 9–10. pp. 731–741.

A short and systematic account of the usual laboratory methods for the diagnosis of amoebic and bacillary dysentery, containing nothing new. The work of English investigators receives due recognition. Thus, with reference to amoebic dysentery WENYON is quoted, and in the description of the necessary bacteriological investigations the methods of HENDERSON-SMITH are followed.

F. E. T.

MANLOVE (C. H.). **Two Cases of Balantidial Colitis.**—*Philippine Jl. Sci.* Sec. B. Trop. Med. 1917. May. Vol. 12. No. 3. pp. 149–163.

The first case was that of a Filipino aged 16. He had blood in the stools for several days two months before admission to hospital, but the attack cleared up without treatment. Since then daily chill and fever had occurred with alternate constipation and diarrhoea. The attack for which he was admitted began with frequency of motions containing blood, a motion every fifteen minutes. He was treated previous to admission for amoebic dysentery and after admission a diagnosis was suggested as follows :—bacillary dysentery, pulmonary tuberculosis and malaria. Bodily emaciation, rapidity of pulse, diarrhoea and some fever were the chief facts observed. *Balantidium coli* was found in the faeces with ova of Trichiurus. The blood was negative for typhoid and malaria, the haemoglobin being 75 per cent. Leucocytes on March 2nd 8,400, on March 3rd 15,400, composed of polymorphonuclears 85 per cent., small lymphocytes 10 per cent., large lymphocytes 1 per cent., transitionals 2 per cent. and large mononuclears 2 per cent. The patient died, and at autopsy the following condition was found :—Acute and chronic ulcerative colitis (balantidial), intestinal haemorrhage, acute suppurative pleuritis, broncho-pneumonia, acute parenchymatous neplrritis, acute dilatation of the right ventricle of the heart, hyperplasia of spleen, trichiuriasis. A full detailed description of the macroscopic and microscopic findings

is given. Balantidia were found in the blood vessels of the muscles at the margin of the ulcers in the large intestine. No Balantidia were found in the affected lung and pleural sac, but the author notes that culture from the pleuritic fluid was negative as regards bacteria.

The second case, a woman of 51, also ended fatally but the gut condition was of secondary importance in this case. The question of pathogenicity and mortality rate from this infection are discussed. The author refers to the work of WALKER, STRONG, BOWMAN, WILLETS and SOLOWJEW.

B. Blacklock.

SPRUE.

ASHFORD (Bailey K.). **The Etiology of Sprue.**—*Amer. Jl. Med. Sci.* 1917. Aug. Vol. 154. No. 2. pp. 157–176. With 10 figs.

The object of this paper is to demonstrate that the species of Monilia first described by the author in March 1915 is the determining etiological factor in sprue, and to suggest that this species be recognised as *Monilia psilosis* Ashford 1914. The organism was isolated from cultures from scrapings of the tongue on glucose agar slants and streak cultures from the faeces on glucose agar plates.

Monilia psilosis is a large round, bright, clean-cut yeast from 4 to 7μ in diameter, with a few granules and a nucleus. There is also usually a pale vacuole in which a violently motile bacillus-like body moves about. The contour is always extremely sharp and well-defined, and this contour becomes a shell-like envelope in older yeasts, often thick at one pole, thus tending to become oval, and giving a true signet ring appearance. Innumerable variations are constantly present, including large numbers of smaller yeast cells reproduced by gemmation and as yet imperfect in development and structure. *Monilia psilosis* always produces mycelial elements, consisting of hyphae 2 to 5μ broad and of all lengths up to 1,000μ. Culturally the most important media are Sabouraud's glucose agar, gelatine and litmus milk. On glucose agar it produces a faint greenish creamy soft elevated growth, with clearly defined borders and a mycelial extension beneath into the growth. On gelatine stab cultures it produces an inverted pine-tree-like growth, with fine long hair-like mycelial extensions into the non-liquified medium. Litmus milk is rendered alkaline. The only sugars normally fermented by *Monilia psilosis* are glucose, levulose, and maltose (typically always), saccharose (often) and galactose (occasionally). In liquid media a more or less abundant sediment collects and there is no clouding of the medium.

Sprue is a disease of the prime of life; affects more females than males; is an urban disease, being much more prevalent in those able to live well; and is a rare disease among negroes. It is a communicable disease and may be found in more than one member of a family. The onset is often acute dating from a severe "indigestion" or other acute inflammatory condition of the upper intestinal tube.

The disease in this series has not been confused with pellagra, although the danger of such confusion is not to be overlooked when the skin lesions of pellagra are absent.

F. E. Taylor.

DOLD (Hermann). **The Etiology of Sprue.**—*China Med. Jl.* 1917. Sept. Vol. 31. No. 5. pp. 387–392.

By the analysis of some hundred sprue stools in China, Dold found that either an Oidium (possibly identical with the Monilias of BAHR and of ASHFORD) or blastomycetes were present in much larger numbers than in normal stools. Pure cultures of the oidia and blastomycetes were fed to dogs, rabbits, monkeys and mice, and produced in the mice a type of diarrhoea which closely resembled typical sprue diarrhoea

and in the dogs a transient diarrhoea sprue-like in character. Two of the three monkeys (*Macacus rhesus*) experimented on developed a sprue-like diarrhoea, the stools being soft, voluminous, greyish-white foamy, acid in reaction, and containing large numbers of the oidia and blastomycetes which had been given with the food. Of the two affected monkeys one died, the post-mortem findings closely resembling those of sprue.

In Dold's opinion the essential factor in sprue is a disturbed balance of the bacterial activity in the digestive tract, the activities of organisms of high fermenting power (Oidia, Monilia, Blastomycetes, and possibly others) overpowering the normal bacteriological activities throughout the alimentary canal. He considers that the presence of a predominating number of acid and gas producing microbes throughout the digestive tract explains the characteristic symptoms of sprue and the typical form of the sprue diarrhoea, the anaemia, the emaciation and the shrunken liver.

The presence of an overwhelming number of carbohydrate-splitting microbes accounts for the great loss in carbohydrates, whilst the diminished fat resorption is explained by the acid chyme both impeding the emulsification of the fats and diminishing the action of the lipase. This deficiency of fat resorption produces a disuse-atrophy of the digestive glands with diminution and even arrest of their secretions. Further, Dold believes that the presence of these acid and gas producing microbes and of their products causes an inflammation of the mucous membranes of the intestines, eventually leading to atrophy of the inflamed parts; and it is conceivable that the pancreas also participates in this inflammatory process and consequential atrophy.

F. E. T.

MICHEL (Carl). **A Study of Toxins and the Serological Reactions in Sprue.**—*Amer. Jl. Med. Sci.* 1917. Aug. Vol. 154. No. 2. pp. 177–181.

The author has investigated the toxicity and serological reactions of the *Monilia psilosis* of ASHFORD.

Cultures of a virulent *Monilia psilosis* isolated from a fatal case of sprue were toxic to guinea-pigs, 10 cc. killing a guinea-pig in forty-eight hours. No soluble toxins could be obtained, whilst Monilia proteins and endotoxins were found to be the active toxic substances in sprue.

Agglutination tests with a Monilia emulsion were positive only in cases with severe sprue, being negative in mild and latent cases.

Precipitin tests using Monilia filtrates were tried, but did not yield any satisfactory results.

Complement fixation tests were also made, using as antigen a watery emulsion of a four weeks' culture of *Monilia psilosis* on Sabouraud's glucose agar, heated to 58° C. for one hour, with the addition of 0·5 per cent. phenol. A very stable antigen was thus obtained. Liver extracts from a patient dying of sprue made an unsatisfactory antigen. An alcoholic antigen made from emulsions of Monilia was also employed.

Out of 400 tests made in cases clinically diagnosed as sprue—from which *Monilia psilosis* was isolated from the tongue and faeces, the

complement fixation test was positive. In cases of chronic and latent sprue, and in cases which had recovered, the reaction tends to become negative. With other Monilia antigens a positive reaction was obtained in 15 per cent. of the cases.

Guinea-pigs inoculated with non-virulent or killed cultures of *Monilia psilosis* also gave positive reactions, the reaction becoming negative as the animal recovered. Cases which had clinical syphilis and sprue gave a positive complement fixation test for both these diseases. Several severe cases of pellagra were also tested, the reaction being negative in all cases except one in which a faintly positive result was obtained.

F. E. T.

MICHEL (Carl). **On the Use of a Monilia Vaccine in the Treatment of Sprue.**—*Jl. Infect. Dis.* 1918. Jan. Vol. 22. No. 1. pp. 53–61.

This vaccine was prepared from autolyzed cultures of *Monilia psilosis* isolated by ASHFORD from a fatal case of sprue. The emulsion of the autolysate was sterilized at 56° C. for one hour with the addition of 0·5 per cent. phenol. For standardisation the killed emulsion was centrifuged, the amount of sediment being 1 per cent. of the standard emulsions used. Six injections of this emulsion were given at intervals of from 8 to 14 days, the primary dose being 0·05 cc. increasing to a final dose of 1·4 cc. A local and general reaction with increased soreness of the tongue and aggravation of the gastro-intestinal symptoms was usually observed, especially after the first injection. The results of the vaccine treatment were very encouraging, the most notable feature being a gain in weight, which was progressive from week to week. There was also a great improvement in the general physical condition of the patient, with disappearance of the Monilia from the faeces. Of 62 patients treated, 49 were discharged cured, 12 were improved and 1 died. A *Monilia psilosis* vaccine should certainly be tried in other localities where sprue occurs.

F. E. T.

WATERFIELD (Noel E.). **A Case of Sprue from Mecca.**—*Trans. Soc. Trop. Med. & Hyg.* 1917. July. Vol. 10. No. 8. p. 197.

A native of Hadramut, aged 60, who had been living in Mecca for some years, presented himself for treatment at Port Sudan, complaining of loss of flesh, frequent stools and soreness of the tongue of three months duration. There was also much pyorrhaea alveolaris, and the mouth was full of septic stumps. CHALMERS of the Wellcome Research Laboratory obtained a pure culture of *Monilia enterica* from the saliva and faeces.

All septic stumps and carious teeth were removed. The diet was restricted to milk with an occasional orange, and salol and beta napthol were administered in a bismuth mixture. Within four days the diarrhoea stopped, and in a fortnight the patient left hospital, having put on nearly half a stone and considering himself cured. The cure appeared to be permanent and the exclusively milk diet was persisted in.

F. E. T.

HIATT (Houston B.). **Sprue.** — *Reference Handbook of the Med. Sci.* pp. 917–919.

This is an excellent systematic account of sprue, especially as it occurs on the American Continent, great stress being laid on its history in America, from its first mention in American literature in the writings of John BRICKNELL in 1737 to WOOD's paper on "Sprue in the United States" presented before the Association of American Physicians in May 1915. A good systematic account of the etiology, pathology, diagnosis and treatment of sprue follows.

F. E. T.

MALARIA.

PUNJAB. **Report on Malaria in the Punjab during the Year 1916, together with an Account of the Work of the Punjab Malaria Bureau.** By Col. H. HENDLEY [M.D., K.H.S., I.M.S.], Chief Malaria Medical Officer, Punjab.—18 + xxxiv pp. With 3 charts & 4 maps. 1917. Lahore: Printed by the Superintendent, Government Printing. [Price Rs.2 or 3*s*.]

Deaths from "fevers"—a term which, when plague does not complicate matters, is almost synonymous with malaria fevers—numbered 376,033 in the Punjab during the year 1916, a death rate of 19·44 per 1,000. In Lahore, the capital of the province, the death-rate for fevers was 21·13 per 1,000.

Altogether the year is considered to have been unfavourable to Anopheles: abnormally heavy rain in July and August disturbed the breeding-places, an unusually dry September dried them up, and heavy rains again early in October flushed them out at a critical season.

Attention was directed particularly to the question of infectibility of *Anopheles rossi*: innumerable dissections were made, with a negative issue. And yet at Khewra, in the Jhelum District, where the spleen-index is 64·46, the only species known is *A. rossi*. It is pointed out, however, as a significant fact, that among the few breeding-places at Khewra, which is at the foot of the Salt Range, there is a brackish stream. The question will be investigated further.

At Katas, in the sacred tank, Anopheles larvae were abundant, although the tank is full of fish of species whose young are known elsewhere to feed upon larvae. The same phenomenon was observed in the ponds of the Shalamar Gardens at Lahore, to which no particular sanctity attaches. Also in the ponds of the Lawrence Gardens at Lahore ducks and Anopheles larvae live happily together.

Efforts to quinine school-children were not very successful: apparently the local dominies were not sufficiently interested in the matter. Quis custodiet ipsos custodes? But steps have been taken to see that this does not occur again.

A. Alcock.

SULDEY (E. W.). **L'index endémique du Paludisme à Madagascar Valeur de la formule leucocytaire dans l'évaluation de l'index, comparativement à la splénomégalie, l'hématozoaire et les mélanifères.**—*Bull. Soc. Path. Exot.* 1917. Dec. Vol. 10. No. 10. pp. 915–923.

The author tabulates and discusses very critically his observations of children, in a very insalubrious district on the west coast of Madagascar, for determining the endemic index of malaria. He concludes that neither splenomegaly alone, nor the presence of parasites alone gives the true index, since malarial infection may exist without any indication of either; but that the true index can only be determined

if the melaniferous leucocytes be also taken into consideration as a third factor. Finally the index may be confirmed by leucocyte count, and the author gives the following table of leucocyte-formulae at divers ages, determined from cases in which parasites were actually observed in the blood :—

Leucocytes	1-3 years	4-6 years	7-9 years	10-12 years
Neutral multinuclears ..	28	35	34	31
Lymphocytes	50	48	47	52
Large uninuclears ..	14	10	11	8
Eosinophile multinuclears	8	7	8	9
Basophile multinuclears	0·5	0·5	0·5	0·5

The author does not fail to notice that the possibility of syphilis must not be overlooked among the inferences from both splenomegaly and increase of large uninuclears, and that intestinal worms must be discounted from the evidence offered by the eosinophiles.

A. A.

SIMPSON-WELLS (A.). **Notes on Malaria.**—*S. African Med. Rec.* 1917. Nov. 24. Vol. 15. No. 22. pp. 344–347.

General remarks upon malarial fever and its treatment. The manifold disguises assumed by malaria are noticed, and abstracts of two cerebral cases of pernicious malaria, in one of which the symptoms were almost like those of acute mania, are given. The author has found intramuscular injections of quinine very satisfactory in cases that resist other methods. Prior to an intravenous injection he is accustomed to abstract about half-a-pint of blood. He thinks galyl has a tonic effect, and that it assists the action of quinine, and he approves of its use in anaemic cases with frequent relapses.

In the subsequent discussion Colonel MAXWELL mentioned that at a General Hospital known to him, where the symptoms following operations had suggested contamination of ligatures or dressings, malaria was discovered to be the cause of the alarming symptoms.

A. A.

ANDREOTTI (Marino). **La precarietà del cosiddetto Anofelismo senza malaria. Nota di profilassi antimalarica nella popolazione civile e nell' esercito.** [The Insecurity of So-Called Anophelism without Malaria. A Note on Anti-Malarial Prophylaxis in the Civil and Military Population.]—*Policlinico.* Sez. Prat. 1917. Dec. Vol. 24. No. 51. pp. 1492–1494.

Notes of a case in which a soldier on leave from the Italian army developed malaria with the result of infecting two children in the house. The locality was one in which Anopheles mosquitoes were plentiful, but malaria usually absent. The cases occurred in the latter end of May and the beginning of June, when mosquitoes usually

begin to appear in the locality. The greater part of the paper is devoted to a discussion on the general question of neglecting mosquitoes while giving quinine.

J. B. Nias.

MOLA (G.). **La campagna antimalarica del 1916 alla base navale di Vallona.** [The Anti-Malarial Campaign at Valona during 1916.]—*Ann. Med. Nav. e Colon.* 1917. July-Aug. Year 23. Vol. 2. No. 7–8. pp. 578–583.

A report dealing with the treatment of malarial cases at the Italian naval base of Valona in the Adriatic during the year 1916. Out of a total strength of about 1,600 men in port, the number of cases between June and October was as follows:—

June	24	= per cent.	1·47
July	214	„ „	13·0
August	311	„ „	18·0
September	238	„ „	14·0
October (1st half)	0	„ „	0

The types of fever noted were tertian and aestivo-autumnal only. Preventive treatment with quinine was enforced rigorously, while all collections of stagnant water were carefully petrolized. Patients in hospital received a subcutaneous injection of 3 grammes of quinine at the outset of the fever, with 1 gramme daily afterwards as long as the fever lasted, or for a minimum of 10 days. After this the patient took by the mouth quinine in tabloids to the extent of two or three times the ordinary prophylactic dose. Thanks to this vigorous treatment, bad results were rare, even with the aestivo-autumnal form.

J. B. N.

FIORITO (G.). **Su di alcune particolarità del reperto emoparassitologico dell' infezione malarica.** [Some Unusual Results of Blood-Examination in Malaria.]—*Ann. Med. Nav. e Colon.* 1917. July-Aug. Year 23. Vol. 2. No. 7–8. pp. 583–596.

Studies in the haemo-parasitology of malaria made at Valona by the author, dealing with matters of minute microscopical detail and not of much general interest. The paper is not in any way illustrated, as it should be, to be of any real use. The quartan parasite was never observed. The mosquitoes collected were *A. maculipennis, bifurcatus* and ~~super~~*pictus*, in order of frequency.

Pseudo

J. B. N.

ROSSI (Giacomo). i.. **I nuovi orizzonti delle ricerche antimalariche ed i nostri impianti sperimentali.** [New Ideas on Anti-Malarial Research and Experimental Stations.]—*Malariologia.* 1917. Aug. 15. Ser. 2. Year 3. No. 4. pp. 73–83. With 11 figs.

ii. **Il Mezzogiorno e la Bonifica Agraria.** [The South of Italy and Drainage Works.]—*Ibid.* pp. 84–87. With 4 figs.

FERMI (Claudio). iii. **Deve preferirsi il metodo antianofelico od il metodo agricolo per smalarizzare una località?** [The Relative Merits of Anti-Mosquito Campaigns and Intensive Culture, as Preventives of Malaria.]—*Ibid.* pp. 88–89.

These three papers are chiefly occupied with a personal controversy between the two authors on the relative advantages of drainage and quinine-prophylaxis, on the one hand, and intensive cultivation of the land, on the other, as regards the suppression of malaria. Professor Fermi is an advocate of the former system, and Professor Rossi of the latter. Professor Rossi holds that if land is sufficiently well cultivated, there will be no malaria, even in the presence of stagnant water and Anopheles mosquitoes, and cites an instance in point. Rossi's first paper contains several interesting illustrations of an experimental station for the study of the fauna and flora of marshes, and other matters connected with malaria.

J. B. N.

KISSKALT (Karl). **Ueber Malariarezidive.** [Malarial Relapses.]—*Deut. Med. Woch.* 1917. Dec. 6. Vol. 43. No. 49. p. 1527.

The malaria figures, obtained by blood examinations, in the year 1916 for the troops in East Prussia (First Army Corps) and the prisoners of war are given. Infections were not seen till April, increased till July, and tailed off to October. Of the 165 infections all but four were benign tertian. Three patients must have become infected in Germany; by far the majority had been in Russia or the Balkans in 1915. Relapses are usually attributed to excessive exertion or the bites of over-wintering Anopheles; but here over-exertion was at least as great in the winter, and if Anopheles had been the cause there would have been cases in barracks and among the civil population. The conclusion is that relapses of malaria in the spring are produced by sunlight just as is the case with pellagra. REINHARD and HEINRICH are quoted in support [this *Bulletin*, Vol. 11, p. 34, and below].

A. G. B.

KABELIK (J.). **Einige Bemerkungen zur Pathogenese und Pathologie der Malaria.** [Remarks on the Pathogeny and Pathology of Malaria.]—*Wien. Klin. Woch.* 1917. Dec. 20. Vol. 30. No. 51. pp. 1616–1618.

The gist of this article, which deals with the pathogeny of relapses as studied by the author in the post mortem room, is that it is the business of the spleen to filter off effete parasites and pigment, whereas the seat of undamaged parasites and division forms is the bone marrow. In the marrow are found "plasmatic" forms, rings, typical gametes very seldom, and mature crescents hardly ever. The cause of relapse he believes to be the "plasmatic" forms in the resting state. These normally develop into sexual forms, but in the event of a great stimulus are poured into the blood.

A. G. B.

GRALL. **Malaria des Armées en campagne.**—*Ann. d'Hyg. Pub. et de Méd. Légale.* 1917. May. Vol. 27. 4 Ser. pp. 283–344. With 19 charts.

The subject is treated somewhat discoursively, and apart from its discriminative attention to clinical phenomena the paper is considerably speculative. The author regards malaria as it usually occurs in armies of occupation as an epidemic, often complicated with epidemic amoebiasis. He emphasises this association, since the dysenteric or hepatic complication is commonly overlooked in such cases, which are then treated unsuccessfully as malaria when they ought to be treated specifically as amoebiasis. In dealing with primary malarial infections he distinguishes between primary infections of the spring and primary infections of the aestivo-autumnal season. In the former the symptoms are those of a febricula—a temperature continuously a little above the normal but declining in the evening, gastric derangement, and a mere feeling of indisposition; the genuine tertian type of malaria indeed is never an early manifestation of primary infection, but always a late one. In primary infections of the summer the symptoms are those of continuous fever. Re-infections in all chronic cases are manifested by relapses of the tertian type; and this may explain the fact that a patient whose blood on admission to, and shortly before discharge from, hospital exhibits only *P. vivax*, yields only *P. falciparum* during the continuation of the fever in the epidemic period. The re-infection is followed in due time by an access of fever which starts the old infection; and this of course occurs in cases where the original infection was not recognised or was wrongly diagnosed. The cause of the cachexia of acute malaria does not appear to have been explained, in the author's opinion. Whatever may be the ultimate explanation of the haemoglobinuric complication in chronic malaria, sudden cold is an exciting cause. Prevention is discussed in all its aspects—general prophylaxis, anticipation of relapses, segregation of patients, etc. A certain amount of acquired immunity has been observed, particularly among the African contingents in Macedonia.

A. A.

VON HEINRICH (Hans). **Mischinfektionen und Latenzerscheinungen der Malaria.** [Mixed Infections and Phenomena of Latency in Malaria.]—*Wien. Klin. Woch.* 1917. Oct. 18. Vol. 30. No. 42. pp. 1317–1320.

This paper gives statistics of 1029 cases treated during seven months at the Malaria Hospital, Sarajevo, as shown in the following table. There were 150 mixed infections, namely tropical + benign tertian 140, tropical + quartan 5, all three forms 4.

The mixed infections in most cases were not diagnosed until the latent benign tertian parasites appeared in the spring, which is their optimum period of development, just as autumn is the optimum period for the tropical parasite. The two parasites can be co-existent; each has its own characters; no transitional forms were seen; so that there is no evidence that one changes into the other as has been supposed by LAVERAN and others. In recording the type of parasite dates should always be given.

Month	Number of exams.	Findings		Tertian			Tropical			Quartan
		Positive	Negative	Young forms	Half-grown	Full-grown	Rings	Crescents	Rings and crescents	
October ..	207	137	70	2	1	6	58	29	33	3
					9			120		
November	511	178	333	2	—	7	52	77	39	—
					9			168		
December .	410	202	208	2	—	7	72	73	43	1
					9			188		
January ..	514	273	241	6	2	31	82	83	55	1
					39			220		
February –	573	321	252	22	16	60	58	106	39	3
					98			203		
March ..	133	40	93	5	—	13	10	7	3	2
					18			20		
April ..	832	346	486	56	9	165	31	59	12	1
					230			102		
May ..	507	181	326	37	20	62	12	35	3	3
					119			50		

Noting that in winter the intervals were long and the relapses slight, whereas the frequency and severity increased in the spring, the author tried to produce relapses by exposure to the sun. With benign tertian his experiments were usually successful if the patient lay in the sun for an hour with his clothes on.

A. G. B.

MUEHLENS. **Praktische Winke zur Erkennung und Verhütung von Malariagefahren.** [Hints on the Recognition and Prevention of Malaria.]—*Deut. Med. Woch.* 1918. Jan. 3. Vol. 44. No. 1. pp. 7–9.

This paper contains little that is new. To render a latent malaria active and bring the schizonts into the circulation, where they can be recognised and treated, the author advises cold douches to spleen hot packs, or ultra-violet irradiation [see this *Bulletin,* Vol. 11, p. 34].

Parasites should never be classified as quinine-fast without the most exhaustive investigation. Recent experience has modified prophylactic estimates of quinine, and has more and more confirmed the anti-mosquito policy. An account is given of the French anti-malaria campaign proposed by LEGROUX [see this *Bulletin*, Vol. 10, p. 172].

A. G. B.

MUNK (Fritz). **Kriegserfahrungen bei Malaria.** [War Experience of Malaria.]—*Berlin. Klin. Woch.* 1917. Nov. 19 & 26. Vol. 54. Nos. 47 & 48. pp. 1131–1134; 1152–1156. With 10 charts.

A lecture containing some observations of interest. The locale was a military hospital into which were collected all the cases of malaria from Poland and Wolhynia, in nearly every instance benign tertian. A table impresses statistically the generally recognised advantage of solutions over quinine in tablet form. Salvarsan, it is stated, will almost invariably cut short an attack of benign tertian, without however lasting benefit. It was given (1) if the patient was admitted in wretched condition and it was desired to give him a period of rest from quinine; (2) if quinine was borne badly owing to stomach or intestinal trouble; (3) "in relative or absolute quinine resistance"; in any case quinine was resumed as soon as possible. It was not practicable to keep the patients under observation longer than 50–60 days, so that the author recognises that he cannot compute the number of recoveries. In doubtful cases however he employed a test or ordeal: quinine having been omitted for 8–10 days the patient was made to run, chop wood, put his feet in cold water, or take a steamer excursion or rowing exercise; or he was put in a convalescent company. In other instances an intravenous injection of nucleo-hexyl was given. If the result of the stimulus was a relapse, the patient was subjected to treatment afresh. The treatment results were extraordinarily good, for it is stated that 96 per cent. of the cases were discharged to war duty after two months or, in a small number of cases, three [actual figures are not furnished]; there were no deaths. The favourable results are attributed to individual attention and especially to the excellence of the climate. Quinine prophylaxis was not practised; every case was detected as early as possible and removed at once to the hospital, where all precautions were taken to avoid spread of infection. It is stated that the results were excellent and the occurrence of cases was only sporadic; in neighbouring bodies of troops who received quinine regularly the incidence of malaria was much greater.

A. G. B.

KELLER. **Die Bedeutung der Malaria für die Heimat.** [The Importance of Malaria to German Practitioners.]—*Deut. Med. Woch.* 1917. Nov. 29. Vol. 43. No. 48. pp. 1505–1506.

Gives hospital cases in which without a history of malaria an attack of fever occurring after admission was found to be due to malarial parasites; the patients in question were admitted for gonorrhoea, double pneumonia with middle ear suppuration, tape worm and itch. Persons who have contracted malarial infection are now numerous in

Germany and will be more so after the war when the large number of soldiers serving in malarious regions return. The moral is the importance of blood examination in all cases of fever the subjects of which have served abroad.

A. G. B.

PIELSTICKER (F.). **Die Malaria in Rumänien und ihre Bekämpfung bis zum Jahre 1916.** [Malaria in Roumania and Anti-Malarial Measures up to 1916.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1917. Oct. Vol. 21. No. 19. pp. 317–329. With 1 map.

This paper is compiled from the Rumanian records of the last twelve years, the chief authorities quoted being BABES, IRIMESCU, LEON and others, all of whom wrote in the Rumanian language. The whole country has been malarious for hundreds of years. BABES in 7,000 autopsies rarely failed to find evidence of malaria and expresses the opinion that an enlarged spleen is almost a characteristic of the Rumanian. Accurate statistics are not available but IRIMESCU has reached the conclusion that 250,000 to 300,000 cases occur every year. The most severely affected regions lie between the Pruth and the Sereth rivers; the Danube region and the Dobrudja are only a little less affected. The mortality is decidedly less than that in Italy and this is attributed to the preponderance of benign tertian; all three forms are found and blackwater fever occurs. Fresh cases are first seen in mid-June. The carriers are *Anopheles maculipennis* and *A. pseudopictus* which are widely distributed. Little has been done to get rid of them and the problem of drainage seems to be a difficult one. Excellent results, if one may judge from the figures cited, have been obtained from prophylactic quinine.

A. G. B.

CARNOT (P.). **Les accès palustres de Macédoine: leur évolution chez les rapatriés; leur signification.**—*Paris Méd.* 1917. July 28. Vol. 7. No. 30. pp. 78–85.

A long and interesting paper on malarial fever as observed among men invalided from Macedonia, from which as it covers ground that is fairly well known it is only necessary to make a few selections.

Several cases have occurred where the first symptoms appeared in France long after the original infection in Macedonia—latent malaria.

Relapses in chronic cases sometimes occur in groups or showers—interruption of the normal rhythm. A relapse sometimes occurs without any premonitory symptoms.

In the early part of the first year *P. vivax* was the usual parasite: in the later summer and in the autumn *P. falciparum* was predominant: then again from December to May *P. vivax* predominated. The author is inclined to think that mixed infection explains these phenomena, the original conditions in Macedonia, where a man might be bitten by Anopheles twenty times in a night, being favourable to multiple and mixed infection.

In the treatment of chronic malaria the author advocates intensive quinine combined with continuous arsenic, and prefers arsenobenzol to other arsenical compounds. In the long run, the author thinks, the disease disappears through acquired immunity.

A. A.

LAGRIFFOUL (A.) & PICARD (F.). **Remarques sur le paludisme dans la XVIe région. Cas autochtone à** *Plasmodium praecox.*—*Bull. Soc. Path. Exot.* 1917. Dec. Vol. 10. No. 10. pp. 883–885.

The authors have examined, at Montpellier, several hundred cases of malaria contracted in Macedonia, besides cases contracted in Algeria and Morocco, and also in France. Most of the Macedonia cases were infections that had occurred from June to October, when the presumptive infection would be *P. falciparum*, but in the great majority of the authors' examinations it was found actually to be *P. vivax*. Only twice was a mixed infection of both species observed. Most of the infections from Morocco were *P. falciparum*. In all but one of the cases examined by the authors the original specific diagnosis was confirmed. Notwithstanding that the authors have themselves encountered cases of autochthonous infection, they are convinced that there has lately been a recrudescence of malaria in France consequent on the return of invalided troops from abroad, and they are not fully persuaded that *all* the cases reported as autochthonous are really so. Happily among the autochthonous cases *P. falciparum* has not yet been discovered, the single supposed autochthonous case of this infection being in the authors' opinion open to criticism.

A. A.

MARCHOUX (E.). **Influence du milieu extérieur sur la résistance de l'organisme au paludisme.**—*Bull. Soc. Path. Exot.* 1918. Jan. Vol. 11. No. 1. pp. 1–3.

A criticism of the work of MM. LAGRIFFOUL and PICARD, maintaining with much pith and point, in opposition to those observers, (1) that mixed malaria infections are by no means rare, and (2) that the disappearance of *P. falciparum* from the blood of invalids returned to France cannot be the *direct* effect of climate, but is rather to be ascribed to the effect of climate upon the natural resistance of the patient. As an instance in point, the author quotes the observation of PRÉVÔT, at the Pasteur Institute of Garches, that the serum of horses that have been kept out of doors in winter is more active than that of horses wintered in the stable.

A. A.

LACASSAGNE (Antoine). **Considérations pratiques sur la prophylaxie et le traitement des paludéens en Macédoine.**—*Bull. Soc. Path. Exot.* 1917. Dec. Vol. 10. No. 10. pp. 923–932.

A well-written and interesting account of the author's experiences of malaria in Macedonia, but not containing anything new. The author thinks that the grave complexion of the disease in Macedonia is attributable to constant re-infection owing to the insufficiency of protection against mosquito-bites. In the actual management of cases he believes in continuous quinine treatment by the mouth, and he is satisfied that a daily dose of 0·4 gm. may be continued for many months. In addition to this continuous treatment (0·4 gm. daily) he superposed an intensive treatment for relapses, consisting in ordinary cases of 0·8 gm. three times daily for a term of 3 or 4 days, and in bad cases of 0·8 gm. three times a day for two days in each week as long as

might be necessary. Intravenous injection he reserved for pernicious cases, and intramuscular injection for cases of real or feigned gastric intolerance. As prophylactic measures he was satisfied with screens, mosquito-nets, culicifuge applications, and a daily ration of 0·4 gm. of quinine with the quotidian evening soup.

A. A.

ROUSSEAU (P.). **Reviviscence, en 1916, d'un foyer endémique de paludisme en Beauce.**—*Bull. Acad. de Méd.* 1916. Nov. 7. Vol. 76. Year 80. No. 44. pp. 367–368.

The author reports an endemic malaria-area at Beauce in the Department Eure-et-Loir, on the banks of a small stagnant intermittent tributary of the Loire. He witnesses to the presence of *Anopheles maculipennis*, and to the occurrence of at least five cases of malarial fever in 1916. No possible importation can be suspected, no stranger, no soldier, having visited the place.

A. A.

RAYMOND (Victor). **Paludisme autochtone.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1917. Nov. 29. 3 Ser. Vol. 33. No. 31–32. pp. 1167–1169.

The author has discovered two localities in different parts of the front in France, which have recently become infected with malaria. In both of them small epidemics of malaria have occurred among indiv duals who have never been out of France, and in both of them the necessary conditions of infection have been determined—namely the presence of *Anopheles* in abundance, and of human carriers, the latter being invalids returned from Salonica. The parasite observed in the home-bred cases was *P. falciparum* in one case, and *P. vivax* in all the others.

A. A.

MALLOIZEL & BONNARD. **Note sur le Paludisme autochtone dans la presqu'île de Langle (Golfe du Morbihan).**—*Bull. Soc. Path. Exot.* 1917. Nov. Vol. 10. No. 9. p. 805.

The authors report the existence of indigenous malaria in the Langle Peninsula in the Gulf of Morbihan (Brittany); 8 cases of quartan and 5 of benign tertian were observed: it yields readily to quinine.

A. A.

JAMES (S. P.). **Note recording the Proof that *Anopheles maculipennis* is an Efficient Host of the Benign Tertian Malaria Parasite in England.**—*Jl. Roy. Army Med. Corps.* 1917. Nov. Vol. 29. No. 5. p. 615.

Not finding any evidence of infection in 67 specimens of *Anopheles maculipennis* caught in the sick quarters of patients at Sheerness suffering from locally contracted malaria, the author, between 30th August and 15th September, made some feeding experiments with this

species. In 2 out of 6 specimens fed on a patient carrying gametes of a benign tertian contracted at Sheerness he demonstrated, on the 17th September, numerous zygotes in different stages of development.

A. A.

FULLER (E. B.). **Malaria in Relation to Surgery.**—*S. African Med. Rec.* 1917. Nov. 10. Vol. 15. No. 21. pp. 328–329.

The author describes his novel experiences of operating on malaria-carriers as "Adventures of a surgeon in malaria-land." In such patients an operation of any kind almost always provokes an attack of malarial fever, to the consternation of the surgeon who is unaware of the latent malaria. Such patients take all anaesthetics badly; they do not go under easily, and when under they are prone to sudden collapse. Ether is the safest anaesthetic, particularly the warmed vapour. The author notices the frequent occurrence of spurious cases of the "acute abdomen" genus in malaria, and gives some instances where examination of the blood and response to quinine clarified ambiguous symptoms that at first might have suggested an appeal to the surgeon.

A. A.

MOREAU (Laurent). **Paludisme et blessures de guerre.**—*Arch. Méd. et Pharm. Nav.* 1917. Nov. Vol. 104. No. 5. pp. 321–325.

A brief but useful survey of the influence of traumatism on the malarial diathesis, a subject which, as the author remarks, is not new to medical officers who have served in the tropics. Among the invalids from Macedonia the author has noticed abundantly the effect of wounds and surgical operations in provoking the first display of a latent infection, and in resuscitating a dormant chronic infection of malarial fever. He notices that the malarial complication retards cicatrisation of wounds and consolidation of fractures, and much increases the toxic action of chloroform. The author expresses confidence in quinine. In two grave cases injection of novarsenobenzol was followed by a disappearance of the parasites. Adrenaline is a useful adjunct in asthenic cases.

A. A.

DUNLEY-OWEN (A.). **Malarial Wards in Hospitals.**—*S. African Med. Rec.* 1917. Dec. 8. Vol. 15. No. 23. pp. 359–360.

The author is of opinion that in all hospitals where many malaria cases are treated there should be two malaria wards—one for acute cases, under trained nurses; the other for chronic cases, served by orderlies. Relapses would be transferred immediately to the ward for acute cases; acute cases would be transferred to the ward for chronics as soon as the blood was negative. Diets would be supplied not to individual patients but to wards, to be made use of as necessitated by transfers from ward to ward. Much economy in every direction would be the result.

A. A.

ULLMANN (B.). **Beobachtungen an lebenden Malaria-Plasmodien.** [Observations on Living Malaria Parasites.]—*Virchow's Arch. f. Path. Anat.* 1917. July 30. Vol. 224. No. 1. pp. 56–65.

After informing the world that failing eyesight rather hinders him from observing a single preparation for more than three or four hours at a stretch the author of this prolix paper, having had an opportunity of examining living malaria-parasites, naively proceeds to describe what he saw—with occasional digressions after analogies with leucocytes and salivary corpuscles—as if no one had ever watched a malaria parasite before. The observation of pigment in leucocytes provokes copious excogitations, which end in the hypothetical proposition that leucocytes might quite as easily be transporters as destroyers of malaria-parasites.

SCHAUDINN is mentioned two or three times, and CELLI and GUARNIERI are just alluded to once; no other authority on malaria exists so far as this contribution to the subject is concerned.

If this were the first paper of the kind that he has seen during the last two years the reviewer would greatly hesitate to say what—notwithstanding the admonitions of Truthful James—someone will have to say sooner or later, and that is that there seems to be afoot a sort of *Durchdrängung* with the object of making malaria a German territory.

A. A.

FREEBORN (Stanley B.). **The Rice Fields as a Factor in the Control of Malaria.**—*Jl. Econom. Entom.* 1917. June. Vol. 10. No. 3. pp. 354–359.

A paper of a speculative kind. The moral of it appears to be the obvious one that the malarial possibilities of rice-fields can only be determined, in any locality, when the species of Anopheles that breed in them have been determined. In the Philippines, for instance, the rice lands are remarkably free from malaria, since they are breeding-grounds principally of *A. rossi.*

A. A.

GARIN (Ch.) & GIRARD (A.). **Recherches hématologiques chez les paludéens, entre les accès et pendant les accès.**—*C. R. Soc. Biol.* 1917. Nov. 10. Vol. 80. No. 17. pp. 840–841.

The authors' researches extended to fifty cases, of which only the *mean figures* are here reported.

The percentages of leucocytes are as follows:—

	Poly-neutro-philes.	Eosino-philes.	Large uni-nuclears.	Small uni-nuclears.	Lympho-cytes.
During a paroxysm	67·2	1	17·8	10	4
In the interval ..	59·2	3·1	17	12·7	8

The globular resistance was during a paroxysm 47: in the interval 44·71. The infected red cells were as much resistant as the normal red cells.

The number of red cells in the interval was 4,667,000: at the moment of a paroxysm 4,200,000—the altitude of the observations being 1,050 metres.

A. A.

GARIN (Ch.) & SARROUY. **Les variations de la formule leucocytaire dans le paludisme secondaire.**—*C. R. Soc. Biol.* 1917. Nov. 24. Vol. 80. No. 18. p. 880.

Records of the leucocyte formulae of 106 observations, 62 of which were made during the febrile fits and 44 in the intervals.

Mean leucocyte formula.	In paroxysm.	In interval.
Neutrophile polymorph. ..	67·1	58·7
Eosinophile polymorph. ..	5·2	5·3
Large uninuclear	15·7	19·2
Small uninuclear	8·4	12·2
Lymphocyte	3·6	4·6

A. A.

GARIN (Ch.) & PASQUIER (Ch.). **L'image d'Arneth et l'indice nucléaire neutrophile chez les paludéens.**—*C. R. Soc. Biol.* 1917. Dec. 8. Vol. 80. No. 19. pp. 915–916.

Records of 72 patients, the observations including benign and malignant tertian, febrile fits and intervals, and urticarial complications. The films were stained with haematin eosin, and the enumerations were made by the Sabrazès method (in GILBERT et WEINBERG, *Traité du Sang*). The conclusions stated are that the nuclear index is considerably below normal in malarial cases (i.e., Arneth deflected to the left) and is at lowest during the febrile fit; that it is lower in malignant tertian than in benign tertian infections; and that in urticarial cases it is not so low as in the other malarial cases examined.

A. A.

GARIN (C.), SARROUY & POUGET. **Les syndromes surrénaux frustes dans le paludisme secondaire.**—*Progrès Méd.* 1917. Sept. 29. Vol. 32. No. 39. pp. 324–326.

The author draws attention to an obscure form of suprarenal complication which he has observed in 4 per cent. of his cases of chronic malaria. The general symptoms are an extraordinary pallor, emaciation, asthenia, anorexia, and failure to profit by hill climate. The particular symptoms are tachycardia, a small soft pulse (arterial tension ma. about 12, mi. about 7, Pachon), enlarged and tender liver, diarrhoea alternating with constipation, Sergent's line, and various curiosities of skin pigmentation. The number of red blood cells is about normal, but their haemoglobin component is reduced to 0·70.

Such cases should be treated with adrenalin, and also with iron and arsenic, in addition to the routine quinine treatment for the malaria.

A. A.

GARIN (Ch.) & PASQUIER (Ch.). **Urticaire et paludisme.**—*Lyon Méd.* 1917. Nov. Vol. 126. No. 11. pp. 499–504.

The authors regard urticaria as a symptom of definite significance in the relapses of chronic malaria. They observed it in 30 per cent. of their cases: and in 72 per cent. of the observations it was concurrent with diarrhoea. In the blood of 25 urticaria cases examined in the intervals the proportion of multinuclear leucocytes was considerably decreased and that of uninuclears considerably increased, and the globular resistance was about normal. The authors' conclusion is that general urticaria signifies impaired reaction and a grave infection.

A. A.

MIGLIORINI. **Emorragie retiniche da infezione malarica.** [Retinal Haemorrhages of Malarial Origin.]—*Morgagni.* (Archivio). 1917. Feb. 28. Vol. 59. No. 2. pp. 70–72.

The patient was a married woman, aged 38, who had suffered for 2 months from malarial fever. There was no history of syphilis, and the urine was normal. Some 12 days before examination the patient had noticed one morning, on rising, that objects seen with the right eye appeared covered with a veil. On examination, the visual acuity of the right eye was found to be reduced to 1/10, while the field of vision was reduced on the inner side, the left eye being normal. With the ophthalmoscope a large haemorrhage was visible in the superior-internal quadrant. The rest of the retina was clear and transparent. In the macular region there was a small white effusion, about one-third of the diameter of the papilla, oval in form, and below it were 5 linear haemorrhagic streaks. The further progress of the case is not given.

J. B. N.

ZUELZER (G.). **Klinisches über Malaria. Die Leberperkussion.** [Liver Percussion in Malaria.]—*Deut. Med. Woch.* 1917. Nov. 29. Vol. 43. No. 48. pp. 1502–1505.

The author claims to be able by light percussion of the liver to detect an impending relapse in chronic malaria. Normally with deep inspiration in recumbency the absolute liver dulness in the mammary line is 4·5 to 5 cm. high; in the acute swelling of malaria it rises to 6, 8, or 11 cm.

The author describes a malaria rash, seen on the costal arch, fold of the groin, inner side of thigh, or upper part of nates: irregular bluish red to brown spots, and rings of the size of a lentil to that of a two-mark piece: similar to that of syphilis, but paler, or like the patches described by MURCHISON in typhus.

A. G. B.

MOREAU (Laurent). **Parotidites suppurées d'origine palustre.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1917. Oct. 25. 3 Ser. Vol. 33. No. 27–28. pp. 1027–1028.

Parotitis, which is most often double, may occur in any stage of malarial infection. The inflammation, which generally ends in suppuration, spreads from the mouth, and the pus contains the ordinary forms

of coccus. Owing to sloughing, deep burrowing of pus, and the formation of pockets and fistulae, recovery is tedious. The complications that have been observed are secondary haemorrhage (in one of the author's cases both the external carotids had to be tied), facial paralysis, arthritis of the jaw-joints, and decalcification of the jaw condyles. The prophylactic measures recommended are buccal antisepsis, and the avoidance or counteraction of everything in the general treatment of the malaria that tends to dehydrate the blood or to dry the mouth. Two illustrative cases are abstracted.

A. A.

McWalter (J. C.). **Parotitis and Malaria.**—*Med. Press & Circ.* 1917. July 4. Vol. 104. No. 4078. pp. 548–549.

A pleasant rambling discourse on many things besides malaria and parotitis. The author thinks that in parotitis complicating malaria or dysentery the gland should not be opened.

Among his divers meditations the author lingers fondly on the *vis medicatrix naturae*; but in tropical medicine, at any rate, many would rather agree with Sir William Gull that in nine cases out of ten Nature's intention is to kill the patient, not to cure him.

A. A.

de Brun (H.). **L'amnésie paludéenne.**—*Presse Méd.* 1917. Nov. 1. Vol. 25. No. 61. pp. 625–626.

The author draws attention to amnesia as a frequent interlude in the malaria-drama. In the febrile paroxysms of a first infection the author distinguishes a lacunar amnesia, where, after recovery from a febrile state complicated with bilio-gastric and nervous symptoms, the patient has no recollection of the attack—even though he may never have lost consciousness during the paroxysms. In more chronic cases the author distinguishes (a) retrograde amnesia, where the patient forgets not only recent events but also the occurrences of long-past years, even the things he learned at school; and (b) anterograde amnesia, where the patient cannot concentrate his attention, and may be in such a state of mental confusion that he cannot remember what he set out to do or say—perhaps cannot remember whether he has had his breakfast or not.

A. A.

Marchand (L.). **Tremblement consécutif à l'infection paludéenne.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1917. Oct. 25. 3 Ser. Vol. 33. No. 27–28. pp. 1043–1045.

The patient is a soldier, 22 years old. There is a hereditary predisposition to tremor, but no evidence of any particular affection of the nervous system; no history of syphilis, or of abuse of alcohol, or of any antecedent disease of a serious kind. The tremors came on as a continuation of an ordinary febrile paroxysm two months after the first infection and lasted several days. They then became localised in the hands and arms and have persisted notwithstanding treatment. They cease during sleep, and when a malarial relapse occurs they are intensified and become general again.

A. A.

KAMAR (A. E.). **Malarial Mimicry.**—*Jl. Trop. Med. & Hyg.* 1917. Dec. 15. Vol. 20. No. 24. pp. 277–279.

Summary of two cases of sudden acute malaria of which the symptoms suggested in the one case acute mania, in the other cerebro-spinal meningitis. In the first case, in which the most impressive symptom was violent delirium without fever, the diagnosis was established upon circumstantial evidence (history, enlarged spleen, and quick reaction to intramuscular injections of quinine); in the second case, besides the circumstantial evidence, subtertian parasites were present in the blood, and meningo-cocci were not found in the cerebro-spinal fluid. The author draws the moral that in police cases in tropical towns, besides the recognised alternatives "drunk" or "fatal seizure," there is a *tertia sors*—sudden acute malaria—and he also thinks that a case of pernicious malaria with stuporous or melancholic symptoms and a normal or subnormal temperature might possibly be committed in haste to a lunatic asylum.

A. A.

MOREAU (Laurent). **Sur deux cas de gangrène du pied et de la jambe, ayant pour cause une artérite d'origine palustre.**—*Bull. Soc. Path. Exot.* 1918. Jan. Vol. 11. No. 1. pp. 28–31.

The author refers to two cases of gangrene of the lower extremity, of malarial origin, reported by him in *Presse Medicale*, 22nd March, 1917, in order to emphasise the point that they were not symmetrical gangrene, but unilateral. He gives a full summary of both cases, and although he admits that malarial endarteritis may be rare in comparison with malarial thrombosis of arterioles, he is of opinion that his cases were the result of posterior tibial endarteritis directly due to malaria.

A. A.

LEGER & RYCKEWAERT (P.). **Hématozoaire de la fièvre quarte et accès pernicieux mortel.**—*Bull. Soc. Path. Exot.* 1917. Dec. Vol. 10. No. 10. pp. 879–882.

Quartan fever being by general consent rarely malignant in character and usually tractable to quinine, the authors consider worthy of record a fatal case in their own experience. They state that the number of parasites in the peripheral blood was not numerous; and that post mortem many parasites were found in the bone-marrow, heart muscle, and brain; few in the lungs and liver; and hardly any in the spleen and kidneys. The globular resistance during the paroxysm was normal, and the coagulability of the blood was decidedly increased.

A. A.

WURTZ (R.) & VAN MALLEGHEM (R.). **Accès graves chez des paludéens atteints de tierce dite bénigne.**—*C. R. Acad. Sci.* 1917. May 14. Vol. 164. No. 20. p. 797.

Four Macedonian cases of benign tertian, confirmed by microscopic examination of the blood, in which cerebral symptoms were remarkably predominant. In three of them the symptoms were transports of

delirium and loss of consciousness; in the fourth after oppressive vomiting the patient became cyanosed and unconscious. In no case could anything but *P. vivax* be discovered.

The authors also report that in a year's study of malarial cases from Macedonia, though at the beginning, from August to November, the parasite found in the blood of patients was usually *P. falciparum* and only in a few cases *P. vivax*, yet six months afterwards they could find only *one* case of *P. falciparum*. They ask if it is possible that *P. falciparum* becomes transformed into *P. vivax* in accordance with LAVERAN'S theory.

A. A.

BARTOLOTTI (Cesare). **Recidive malariche.** [Relapses in Malaria.]—*Riv. Crit. Clin. Med.* 1917. Dec. 15. Vol. 18. No. 50. pp. 501–506.

Notes of a case of pernicious malaria, with fatal termination in 4 days, in a soldier who had entered hospital for a gun-shot wound of the arm. The account of the autopsy shows no unusual features. The author, however, takes occasion to point out that an attack of malaria under such conditions is extremely likely to arouse misapprehensions of sepsis, which may lead to unfortunate surgical intervention. The microscopic examination of the blood should never be neglected in any case where there may be a possible suspicion of malaria. A feature of interest in the case was that the spleen weighed one kilogramme and the liver 1·8 kilogrammes, indicating old infection.

J. B. N.

LEINER (Carl). **Zur Klinik und Therapie der Malaria.**—*Wien. Klin. Woch.* 1917. Nov. 8. Vol. 30. No. 45. pp. 1415–1418.

A clinical account of cases from Albania treated at Vienna. Of 138, 120 were benign tertian. One case succumbed to a 0·9 gm. dose of neosalvarsan. The author says a permanent cure was rarely obtained; he gives no details of treatment.

A. G. B.

MACGILCHRIST (A. C.). **How to administer Quinine.**—*Indian Med. Gaz.* 1917. Oct. Vol. 52. No. 10. pp. 345–346.

The author states that the best way of administering quinine by the mouth to malaria patients is with or soon after meals, so that it will be dissolved by the acid contents of the digesting stomach. It does not matter much which salt is given; but the sulphate is the cheapest, and the hydro and bihydrochloride, besides being expensive, may in concentration do harm to a delicate stomach. Bile being an active solvent of quinine, a cholagogue (*e.g.* calomel) should prepare the way for the quinine in the intestine, where otherwise it is likely to be precipitated from solution. The author is of opinion—or, rather, leaves the reader to infer that it is consonant with his opinion—that the efficacy of Warburg's tincture is partly due to the fact that it contains three cholagogues whose undesired purgative properties

are checked by its additional opium constituent. The author refers to some experiments with subcutaneous and intramuscular injections of quinine, but makes no positive recommendations. He also refers to intravenous injections, and expresses the opinion that large amounts of saline solution used in diluting the quinine for such injections cause useful diuresis and elimination of toxins. He also states, as S.M.O. of a brigade, that the preventive method in "attacks" of fever of keeping regimental registers of men in poor health and giving to each registered man a prophylactic dose of 15 grains of quinine, at night after the last meal, on two consecutive nights a week, was coincident with an insignificant number of malaria relapses.

A. A.

ROGERS (Leonard). **Pernicious Malignant Tertian Malaria successfully treated by Quinine Acid Hydrobromide Intravenously and the Failure of "Splenox" in Benign Tertian Malaria.**—*Indian Med. Gaz.* 1917. Nov. Vol. 52. No. 11. pp. 385–386.

An epitome of two cases. In the first the patient was collapsed and not fully conscious on admission, and his blood was found to contain 46 malignant tertian parasites per 100 red cells; on the third day, after 3 intravenous injections of 1 gramme of acid quinine-hydrobromide in 10 cc. of water, no parasites could be found. The second case was a chronic benign tertian contracted originally in East Africa, and in the present relapse the patient had been taking "splenox" for 33 days, in full doses, without result; many parasites were found in the blood. On the fifth day, after an initial intravenous injection of 7½ grains of acid quinine-hydrobromide and 3 subsequent injections of 10 grains, the fever was broken and the parasites had dissappeared.

A. A.

FOX (Stephen C. G.). **Intramuscular Injections of Quinine Bihydrochloride in Simple Tertian Malaria.** [Correspondence.]—*Lancet.* 1917. Dec. 15. pp. 909–910.

The author very temperately questions Ross's condemnation of intramuscular injection of quinine. He states that in Perak they have reason to regard this as the decisive method in all obstinate and chronic forms of malarial fever. In one small hospital in Taiping whence exact records have been obtained, 672 such injections were given during the last 12 months, with only 4 accidents—abscess formation. The injection is made into the gluteal region, by a skilled hand. When the fever is under control the injections are stopped and quinine is given by the mouth.

A. A.

GRIFFIN (W. B.). **Treatment of Malaria by Intravenous Injections of Quinine Urethane.**—*St. Bart. Hosp. Jl.* 1917. June. Vol. 24. No. 9. pp. 87–88.

Very strong testimony in favour of the intravenous method of giving quinine. The author says it was a fine sight to see men, who

had been unconscious twenty-four hours before, keen on their breakfast; and that the nightround of the wards was an inspiration after the intravenous method had been adopted. The usual dose of quinine was 6 to 8 grains at one injection. In more than 100 cases the author did not see one bad symptom.

A. A.

STEPHENS (J. W. W.), YORKE (W.), BLACKLOCK (B.), MACFIE (J. W. S.), COOPER (C. Forster) & CARTER (H. F.). **Studies in the Treatment of Malaria. VI. Oral Administration of Quinine for Two Consecutive Days only in Simple Tertian Malaria.**—*Ann. Trop. Med. & Parasit.* 1918. Jan. 31. Vol. 11. No. 3. pp. 283–307. With 25 charts.

Statistics and bare summaries of effects of the exact experimental treatment of seven series of simple tertian malaria cases where quinine was given by the mouth on two several consecutive days in a particular dosage of 5, 10, 15, 30, 45, 60 and 90 grains.

In the first series (5 grains) parasites did not disappear from the blood in 5 cases out of 30.

In the second series (10 gr., 10 cases) parasites disappeared in 2–3 days, parasitic relapses occurred in 10–18 days, and febrile relapses in 12–19 days.

In the third series (15 gr., 14 cases) parasites disappeared in 1–5 days, parasitic relapses occurred in 8–22 days, and febrile relapses in 12–25 days.

In the fourth series (30 gr., 14 cases) parasites disappeared (in 9 cases where the records are complete) in 1–4 days; parasitic relapses occurred in 7–20 days, and febrile relapses in 10–24 days.

In the fifth series (45 gr., 12 cases) parasites disappeared in 1–3 days (but in a single case of a double infection the *crescents* did not disappear); in 9 cases parasitic relapses occurred in 13–25 days and febrile relapses in 12–48 days; and in three cases there were no relapses up to the 50th day of observation—though in one of these cases malignant tertian parasites were found on the 25th day.

In the sixth series (60 gr., 12 cases) parasites disappeared in 1–4 days; in 7 cases parasitic relapses occurred in 11–27 days, and febrile relapses in 14–27 days; and in 5 cases there were no relapses in 61 days.

In the seventh series (90 gr., 76 cases) there was some irregularity of administration in certain cases, owing to vomiting, which had to be corrected by some intramuscular administration. In this series parasites disappeared in 1–3 days; parasitic relapses occurred in 29 cases and febrile relapses in 27 cases; but in 47 cases there was no parasitic relapse within an observation term of 53–165 days, and in 49 cases there was no febrile relapse within the same observation time.

The patients who received a dosage of 90 grains in one day were to some slight extent discomforted.

In all the series of cases the salt used was the sulphate, except in part of the first (5 gr.) series when the bihydrochloride was tried.

A. A.

MOULINIER. **Des injections de quinine. Avantages d'une solution récemment préparée et non bouillie.**—*Arch. Méd. et Pharm. Nav.* 1917. Nov. Vol. 104. No. 5. pp. 335–340.

The author contends that recently prepared, unboiled solutions are more active than those made up in sterilised ampoules and states that he has proved it in work previously published. His solution for injection is prepared with distilled water sterilised at 120° C. and is stored in sterilised vessels, not more than two days before use. Each cc. contains 0·25 gms.; his limit of dosage is 3 cc. in 24 hours. This solution succeeded where other preparations failed. Four cases are given.

A. G. B.

i. GIEMSA (G.) & HALBERKANN (J.). **Ueber das Verhalten des Chinins im menschlichen Organismus.** [The Behaviour of Quinine in the Human Body.] -*Deut. Med. Woch.* 1917. Nov. 29. Vol. 43. No. 48. pp. 1501–1502. *Arch. f. Schiffs- u. Trop.-Hyg.* 1917. Nov. Vol. 21. No. 20–21. pp. 333–349.

ii. HARTMANN (Heinz) & ZILA (Loro). **Ueber die sogenannte Chininingewöhnung.** [The So-Called Quinine Habituation.)—*Münch. Med. Woch.* 1917. Dec. 11. Vol. 64. No. 50. pp. 1597–1598.

i. These authors discuss the recent papers by TEICHMANN and NEUSCHLOSZ [see this *Bulletin*, Vol. 11, pp. 21 and 25*]; the former concluded from his experiments that in the urine of quinine habitués less quinine was excreted than in persons were who not habituated, and that this lessened excretion was correlated with a lessened quantity in the blood available to act on the parasites; he sought to correct this by giving the drug intermittently in rising doses; the latter, who got better results by associating neosalvarsan and other arsenicals with quinine than with quinine per se, believed that the arsenical prevented the fixation or destruction of quinine in the tissues. The conclusions reached by Giemsa and Halberkann are to the following effect.—The method employed by TEICHMANN and NEUSCHLOSZ for the estimation of quinine in the urine—potassium mercury iodide—is not suitable as a quantitative test. As a qualitative test it is excellent; it never fails to show whether a patient has taken his daily dose of 0·8 to 1·0 gm. or not. For quantitative estimation the alkaloid must be isolated, for which they believe their own method to be sufficiently exact. Employing this they were unable to confirm TEICHMANN and NEUSCHLOSZ's conclusions that the excretion of quinine in the urine of quinine habitués and others varies in any regular manner. The hypotheses of these workers are not correct. Whether their therapy is of value clinical observation will decide.

ii. These authors, working in the Pharmacological Institute of the Vienna University, estimated the quinine excretion in the urine and the quinine concentration in the blood after a definite dose in a number of cases treated for six months with quinine. The quinine base was isolated by H. H. MEYER's method and weighed. The results of,

* In the last sentence but one of this summary for "destruction of arsenic by the tissues" *read* "destruction of quinine by the tissues."

in all, 27 such urine estimations in these persons and others who received quinine for the first time are shown graphically. The authors were unable to confirm that the excretion was diminished in the former class, and remark that it is subject to large fluctuations. Quinine cannot be estimated gravimetrically after 28–32 hours; not more than one per cent. is excreted after this period. The intensity of the mercury potassium iodide reaction as a measure of quinine excretion in the urine is not reliable, depending as it does on the degree of dilution of the urine. Similarly with the blood—they were unable to demonstrate that after prolonged use of quinine larger quantities of the alkaloid were destroyed. These figures are given in a table; they vary very little in the non-quinine habitués, quinine habitués and quinine habitués who had received the day before an injection of neosalvarsan.

A. G. B.

RAZZAK (Abdur). **Use of Quinoidine.** [Correspondence.]—*Indian Med. Gaz.* 1917. May. Vol. 52. No. 5. p. 179.

The writer has used quinoidine in 500 cases of malarial fever, and has found that 12 grains daily for four days "usually checks all ordinary cases of quotidian and tertian type." It does not affect the sensorium or cause depression so much as quinine. The writer is not certain whether the gastric irritation that occurs when it is given in solution, and the intestinal derangement that occurs after its prolonged use, are cause and effect or merely coincident.

A. A.

HATIEGAN (Julius) & DOERI (Béla). **Ueber die Behandlung der Malaria mit Optochin.** [Treatment with Optochin.]—*Wien. Klin. Woch.* 1917. Sept. 27. Vol. 30. No. 39. pp. 1230–1236.

The patients numbered 37, of whom 33 had benign tertian; all were old cases infected in Russia, the Balkans or the Adriatic. Basic ethylhydrocuprein was used in all cases but 5, which received the chloride. The dosage was 1–1·2 gm. daily, in two or three-hourly doses of 0·2 gm., repeated 3 or 4 times, and then every third or fifth day. The total amount was about 10 gm. in six weeks. In the benign tertian cases the parasites disappeared from the blood in 8–16 hours from the beginning of treatment. The conclusions reached were that given thus the drug was in no way superior to quinine; no symptoms in respect of the vision or digestive apparatus were noticed. In 21 cases, 20 of them benign tertian, the effect of the drug in suppressing relapses was tried. A brief account of 12 is given. Relapses always occurred, in spite of the fact that the patients were kept in bed or at rest. The authors discuss the difference in the results obtained by themselves and by IZAR and NICOSIA [this *Bulletin*, Vol. 3, p. 435], who found that this drug succeeded in cases in which quinine failed, without reaching a satisfactory solution. [For the most recent work see this *Bulletin*, Vol. 11. p. 23.]

A. G. B.

SCHILLING (Claus). **Malaria ; Selbstbeobachtung.** [Malaria ; A Personal Observation.]—*Deut. Med. Woch.* 1917. Nov. 8. Vol. 43. No. 45. p. 1415.

Dr. Schilling left Aleppo on November 12th and spent two nights in malarious places on the Amanus and Taurus ranges. Reaching Constantinople he took prophylactically on two successive days in each week 0·9 to 1·2 gm. quinine hydrochloride, continued for 3–4 weeks. On January 20th he left for Germany. On March 24th, 4 months after leaving a malarial region, he had a slight rise of temperature and two days later another rise, when the blood was found to contain tertian rings. He then began quinine in 1 gm. doses on the 6th and 7th days in each week till May 12th (48 days). Twenty days later he had an attack of malaria. He then decided to take 2 gm. of quinine in the day (in eight doses), lengthening the intervals to 9 days. His state, both objective and subjective, began at once to improve. Parasites have not since been found [? 5 months]. He thinks this dosage should be kept up for two months. Schilling agrees with TEICHMANN [this *Bulletin*, Vol. 11, p. 21], who gives large doses of quinine at infrequent intervals.

A. G. B.

MANAUD (A.). **Traitement des paludéens de l'armée d'Orient en France.**—*Presse Méd.* 1917. Oct. 18. Vol. 25. No. 58. pp. 599–601.

An excellent epitome of the therapeutic treatment of malaria, but not remarkable for anything new or original. The author believes in the periodic interruption of quinine treatment, and in the value of arsenical preparations as adjuvants to quinine ; and he considers intravenous injection to be the ideal method of administering quinine. He is also an advocate of prolonged treatment—3 grammes o' quinine weekly for six months to a year—after discharge from hospital.

A. A.

FALCONER (A. W.) & ANDERSON (A. G.). **Tartar Emetic in Treatment of Malaria.**—*Lancet.* 1917. Nov. 17. pp. 743–745.

Abstracts and records of 8 out of 12 cases in trial of Sir Leonard ROGERS's suggestion [see this *Bulletin*, Vol. 9, p. 306] for the treatment of chronic malaria by tartar emetic. Five of the 8 cases recorded were benign tertian, and in none of these five did the parasites disappear until quinine had been given ; but it may be remarked that ROGERS himself stated that tartar emetic does not seem to have much effect upon the parasites of benign tertian. Only 3 cases, therefore, supply relevant evidence : of these 1 was subtertian, and the other 2 were mixed tertian infections. In the pure subtertian case crescents disappeared after 3 injections of tartar emetic, but in spite of their disappearance and though no parasites of any kind could be demonstrated in the peripheral blood, the patient subsequently had three clinically typical attacks of malarial fever. In the two mixed infections the crescents disappeared, in one case after 4 injections of

tartar emetic, in the other case after a single injection following 60 grains of quinine on the day but one antecedent; in the first case the coexistent benign tertian parasites persisted; in the second case, where quinine had been given to begin with, they disappeared.

In all the cases the tartar emetic was given in 2 per cent. solution with half per cent. carbolic acid, and the doses ranged from 1 to 4 cc.

The authors summarise their experience as disappointing and as not vindicating the tartar emetic treatment.

A. A.

SOTIRIADÈS. **Essais de sérothérapie dans la Malaria.**—*Grèce Méd.* 1917. July. Vol. 19. No. 13–14. pp. 27–28.

Latapas, an Athenian porter, aged 40, and given to drink, attracted the author's attention as an extraordinary case. Though for months his blood was full of crescents, his spleen was if anything contracted, his temperature fluctuated between 95·7° Fahr. and 97·1° Fahr., and he had no febrile paroxysms. His symptoms were those of Addisonian cachexia and debility, with most profound anaemia and deficiency of haemoglobin. Under quinine and tonics his anaemia became improved, but the crescents were not affected. It was thought by the author that Latapas serum might be used therapeutically, and an experiment was made on a patient who appeared to be suffering from a first infection. This patient had an enlarged spleen, fever, and ring forms in his blood, and nervous disturbances and profound debility were prominent symptoms. He was treated with a subcutaneous injection of 10 cc. of Latapas serum, kept upon ice after preparation, and not heated. Eight hours afterwards his temperature had fallen from 103·6° F. to 99·8° F. and all his nervous symptoms had gone. He remained free from fever for four days and then had a milder paroxysm of fever, which was broken in four hours by another injection of 10 cc. of Latapas serum. The following day he was given a third injection of the serum and 12 days afterwards, having been free from fever all the time, he left hospital.

A. A.

NETTER (Louis). **Résistance globulaire et paludisme.**—*Presse Méd.* 1917. Dec. 3. Vol. 25. No. 67. pp. 687–688.

Observations in 61 cases—24 normal and 37 malarial—including Europeans, Jews, Moroccans and other Africans. The technique followed and the experiments made are recorded. The conclusions are that increased globular resistance is a characteristic of a malarial fit, and that the severer the febrile fit the greater is the resistance; that *P. vivax* provokes less resistance than *P. falciparum*; that less resistance is manifest in chronic cases than in recent infections; and that large doses of quinine at the moment of the febrile fit still further increase and prolong the resistance, although the effect is not maintained. The last observation evokes a suggestion from the author that concurrently with quinine, or in the intervals between relapses, antihaemolytic remedies should be administered.

A. A.

NETTER (Louis). **Résistance des hématies déplasmatisées aux solutions chlorurées hypotoniques dans le paludisme.** -*C. R. Soc. Biol.* 1918. Jan. 12. Vol. 81. No. 1. pp. 43–44.

The author has abundantly confirmed his former observations that the globular resistance is increased during the paroxysms of malarial fever. He now further records the results of his observations on the resistance of red blood cells isolated from the plasma, in 4 cases of recent and 14 cases of chronic malaria, 3 of the latter being of the malignant type, observations which show that it is increased relatively to that of the blood intact. Quinine in large doses, particularly by hypodermic and intramuscular administration, increases this resistance still further: without quinine the increased resistance does not long outlast the paroxysm. In the 3 malignant cases this resistance was remarkably increased. In all the above cases the parasites specified were actually observed; but the author has also determined the resistance in malarial patients in whom parasites could not be demonstrated, and in all these it was little or not at all increased.

A. A.

CHATTON (Edouard). **La genèse des stigmates globulaires [taches de Maurer, grains de Schüffner] dans le paludisme. Leurs rapports avec l'amoeboïsme hémamibien. Leur faible valuer différentielle.** —*Bull. Soc. Path. Exot.* 1917. Nov. Vol. 10. No. 9. pp. 841-849. With 1 plate.

From critical examination of films fixed while wet in osmic acid vapour, and then stained in Giemsa 1 in 10 for half an hour, the author concludes that Schüffner's granules and Maurer's spots are two aspects of one phenomenon. In malignant tertian he observed the Maurer's dots to be in continuity with pseudopodia. In benign tertian the same Maurer's dots can be seen in the early stages; but they become very numerous, until they actually meet at many points and overlap to form a sort of network, and the stippling, or "Schüffner's granules," is the deeply-stained nodes of this network.

A. A.

APPEL (Leo). **Zur Färbetechnik der Malariaparasiten.** [The Staining of Malarial Parasites.] — *Cent. f. Bakt.* 1. Abt. Orig. 1917. Aug. 30. Vol. 80. No. 1–3. pp. 105–107. With 2 text-figs.

Elementary instructions for staining a film for malaria parasites. The author recommends, as simple, cheap, and excellent for diagnostic purposes, a stain of watery 1 per cent. methylene blue 1·5 cc. and alcoholic 1 per cent. fuchsin 0·28 cc., in 100 parts of distilled water. The film should be fixed in methyl alcohol, and stained for 15 to 20 minutes.

A. A.

STEVENSON (A. C.). **A Note on the Solubility of Malarial Pigment.**— *Jl. Trop. Med. & Hyg.* 1917. Dec. 15. Vol. 20. No. 24. p. 277.

The author, wishing to remove pigment that interfered with his examination of sections of pathological tissues from West Africa, found

that ordinary acid-alcohol was efficacious. He also found that the same re-agent removed the pigment from malarial tissues and films. He points out therefore that acid alcohol should not be used when the demonstration of malarial pigment is desired.

A. A.

DE JONG (S. I.) & MARTIN (Arthur). **Paludisme et réaction de Bordet-Wassermann.**—*Presse Méd.* 1917. Oct. 25. Vol. 25. No. 60. pp. 617–618.

Commenting on the fact that the blood of malarial patients may give a positive Wassermann reaction apart from any suspicion of syphilis, the authors give an account of their own investigations of the subject; from which they conclude that the Wassermann (or Bordet-Wassermann) reaction retains all its diagnostic value for syphilis in malarial patients if the blood be not drawn at or near the period of paroxysm. It is always preferable to make duplicate observations, one with warmed serum the other with unwarmed serum.

A. A.

KIMURA (G.). **Wassermann Reaction in Malaria.**—*Taiwan Igakukai Zasshi* (*Jl. Formosa Med. Soc.*). 1917. May 28. No. 175. pp. 324–325.

[From Review by R. G. MILLS.]

This reaction is negative so constantly as to constitute a great presumption of complicating or latent syphilis in any positive case test. [See above, DE JONG and MARTIN].

A. A.

DERIVAUX (R. C.), TAYLOR (H. A.) & HAAS (T. D.). **Malaria Control: A Report of Demonstration Studies conducted in Urban and Rural Sections.**—*U. S. Public Health Bull.* No. 88. 1917. Sept. 57 pp. With 32 figs & 4 maps.

A well-illustrated and interesting description of experiments in malaria control in urban and rural areas.

The urban area selected was a lumber town, 165 feet above sea level, and having a population of 2,029, in south eastern Arkansas. The houses are fairly well screened, the streets are unpaved, the water supply comes from deep wells and is distributed in pipes, the sewerage is incomplete. Mosquito breeding-places are abundant—street-ditches, ponds, borrow-pits along railroad, and water-barrels. The local Anopheles is *A. quadrimaculatus.* In 1915, the year before control operations were undertaken, malaria comprised 22·4 per cent. of the total sickness; and in May 1916 when operations were started the parasite-index was 10·95 for white children and 7·25 for black children. Control operations started with a systematic survey in great detail, after which the breeding-places were systematically taken in hand. Old ditches were re-fashioned and cleared of vegetation, and new ditches were made. Borrow-pits were filled, or drained, or oiled. One pond was dealt with. Water-barrels were eliminated as far as possible, and where they were required for industrial purposes were treated with "soda-cake," a dilution of 1 in 400 being found

sufficient. For oiling "fuel-oil" (a heavy crude oil) was used and was applied both by automatic drip-cans and by knapsack sprayers. Where oil could not be employed on account of fire risk a phenol disinfectant was substituted. The population was enlisted by lectures and lantern-shows. The total cost of all measures, including labour and inspection, worked out at $1. 23½ per capita.

As a result the number of Anopheles was very greatly reduced, and the reduction in malaria was estimated to be as follows :—

Reduction by parasite-index	72·33%
„ by comparison of total number of visits	70·39%
„ by comparison of total visits during malaria season	82·07%

The rural area selected was a typical cotton plantation area in south-eastern Arkansas, flat, with a mean elevation of about 130 feet above sea-level, prolific in vegetation, with a good deal of impervious soil and swamp, and a good deal liable to flooding from the Mississippi. The better-class houses had some protection against mosquitoes, but the huts of the tenantry had none. Sanitary arrangements were crude. The prevalent Anopheles was *A. quadrimaculatus.*

After a systematic survey control operations by screening and quinine were started, suitable educational measures also being carried out. For screening 16 mesh galvanised iron-wire cloth was used, the chimneys also being capped. Quinine was administered in 3 and 5 gr. capsules, and also as an emulsion in chocolate ; it was employed in "immunising" quantities of 20 gr. per week for adults (proportionally reduced for children according to age), and in "sterilising" quantities of 10 gr. daily for 30 consecutive days for adults.

Control operations were arranged in two series. In one series houses were screened and quinine was given in "sterilising" quantities to proven carriers ; in this series the reduction of malaria was estimated at 70·6 per cent., and the cost was $1.75¾ per capita. In the other series quinine was given in "immunising" doses to all, and in "sterilising" doses to proven carriers ; here the estimated reduction in malaria was 64·45 per cent., and the cost $0.57 per capita.

Considerable difficulty was experienced in insuring that the quinine was actually swallowed, and not thrown away, or bartered, or hoarded.

A. A.

Derivaux (R. C.), **The Work of the U.S. Public Health Service with Reference to Malaria.**—*Southern Med. Jl.* 1917. June. Vol. 10. No. 6. pp. 472–478. With 1 map & 3 charts.

An unofficial summary of the anti-malarial operations of the U.S. Public Health Service in the 11 south-eastern states of the Union. The subjects investigated include incidence and distribution of the disease, endemic indices, incidence of specific types of malaria, influence of drainage projects, influence of waters "impounded" for industrial purposes, influence of rice-cultivation, etc. ; and the further departmental operations include malaria mosquito surveys, systematic biological and other experiments in the laboratory, and popular instruction by means of lectures and demonstrations. A tribute is

paid to the memory of the late Surgeon R. H. von EZDORF, by whom this branch of the service was most brilliantly initiated. The author naturally does not emphasize the point—but it is as well for the interested spectator to lay it to heart—that in conducting an investigation (of the prevalence of malaria) by the circular post-card method the replies received ranged from 8·63 per cent. to 20·62 per cent. of the circulars distributed.

A. A.

DE GOYON (J.) & BOUVIER (J. E.). **La lutte antipaludique dans un régiment d'Infanterie coloniale en Orient, 1917.**—*Bull. Soc. Path. Exot.* 1917. Dec. Vol. 10. No. 10. pp. 886–890.

Antimalarial procedure followed in the summer of 1917 with an infantry regiment in Macedonia. The prevalent mosquito was *A. maculipennis*, of which 4 per cent of the captures in September were found to be infected.

Stagnant pools were drained, and marshes were oiled. Mosquito-nets and veils were adapted to requirements, the service patterns supplied not being quite approved. Culicide pomades, etc., were not used, as the men disliked them. Huts, etc., besides having all entrances protected, were daily purged of any flies that had got in. From April onwards to June a daily ration of 0·4 gm. quinine was distributed, and after June was increased to 0·6 gm. Towards the end of summer the men became very keen on their quinine, being fully convinced of its efficacy. Latterly the native inhabitants of the locality were removed, and detachments of the regiment were stationed in the neighbouring hills. All malaria patients were treated in especially isolated pavilions. Each case, after confirmation by microscope, received immediately an intra-gluteal injection of 1·5 gm. of quinoform, and during the first week three similar injections.

The total number of men treated, from April to October, was 226, of which 142 seemed without doubt to be new infections on the spot. Of the 226, 55 had a relapse during the month succeeding treatment, 1 had three relapses, and 170 did not relapse. 284 blood examinations were made, of which only 89 were positive; of the latter, 50 showed *P. vivax*, 28 *P. falciparum* and 11 young indeterminable forms.

A. A.

ROCHE (Maurice). **The Prophylaxis of Malaria.**—*Indian Med. Gaz.* 1917. Oct. Vol. 52. No. 10. pp. 349–351.

This writer asserts that malarial fever can be prevented by 5 grains of quinine sulphate taken daily at 5 p.m. He produces a good deal of hearsay in support of the statement; but the evidence that he regards as conclusive, in his own experience, is that three officers who took quinine in the way specified during the malaria season of the extremely malarious Rufigi basin in E. Africa escaped infection, when all the other Europeans, all the Indians, all the extraneous camp-followers, and many of the indigenous Africans became infected. Unfortunately he does not say whether these three officers were the only individuals in the whole force who took quinine, nor does he

furnish any further particulars about these officers, except that they acted independently; so that although his experience is interesting it does not satisfy all the requirements of an experimental induction.

A. A.

DOFLEIN (Franz). **Ueber mazedonische Anophelinen und ihre Bedeutung für die Verbreitung der Malaria.** [Anophelines in Macedonia and their Rôle in the Spread of Malaria.]—*Münch. Med. Woch.* 1918. Jan. 1. Vol. 65. No. 1. pp. 17–18.

Anophelines are found throughout the warm weather in Macedonia in great numbers, though in the long hot summer all the pools dry up. Water is however found on the hills and their slopes. *A. maculipennis* Mg. and *A. superpictus* Gr. are the species. The former is the commoner and the usual malaria carrier. *A. superpictus* was found in some places in great numbers, especially in the Vardar valley. It breeds not only in pools and rain casks, but also in the brooks of the gullies which are characteristic of the Macedonian formation, where the larvae are found in the running water as well as the stagnant pools, keeping close to the stony margins. Lazarets which were placed near such brooks, in the belief that Anopheles do not breed in running water, were attacked by malaria. The only instance of such occurrence of which the author is aware is that of *A. maculatus* in Malaya (Malcolm WATSON) [but other species are known to breed in running water where there is floating vegetation to protect them].

A. G. B.

COT & HOVASSE. **Quelques remarques sur les Anophélines de Macédoine.** —*Bull. Soc. Path. Exot.* 1917. Dec. Vol. 10. No. 10. pp. 890–896. With 1 text-fig.

Three species of Anopheles have been observed in the neighbourhood of Salonica, namely *A. maculipennis, A. superpictus* var. *macedoniensis* and *A. bifurcatus*; the last being rare. The two first are the principal malaria carriers of the locality: eight per cent. of the specimens captured, mostly at Mikra, were found to be naturally infective.

A. A.

VOGEL (R.). **Bemerkungen über das Vorkommen von Anophelesmücken in Pferdeställen und über die Vertilgung von Anophelesmücken.** [Remarks on the Occurrence of Anopheles in Stables and the Extermination of Larvae.] — *Münch. Med. Woch.* 1917. Nov. 13. Vol. 64. No. 46. p. 1509.

A note evoked by the dictum of FULLEBORN that Anopheles are found in byres but not in stables. The author found them often in the latter situation on a part of the Western Front; from dark unclean stables of wood construction they were never absent. He exterminated them over a small area by enticing them to ovulate in fire buckets, the water in which was then covered with a layer of saprol.

A. G. B.

INGRAM (A.). **A Key to the Species of Anopheles occurring in the Gold Coast.**—*Report of the Accra Laboratory for the Year 1916.* 1917. London: J. & A. Churchill. pp. 83–86. With 3 plates.

The author gives a key and brief diagnosis of the 12 species of Anopheles that occur in the Gold Coast. The key is adapted from EDWARDS' key of African species published in the *Bulletin of Entomological Research*, Vol. 3, pp. 242–245, and the supplementary diagnoses are much to the point.

A. A.

GENUARDI (G.). **La malaria a Brindisi e nei dintorni.** [Malaria at Brindisi and its Neighbourhood.]—*Ann. Med. Nav. e Colon.* 1917. July-Aug. Year 23. Vol. 2. No. 7–8. pp. 625–634.

The outbreak of war brought a large number of soldiers and sailors to Brindisi with a corresponding augmentation in the amount of malaria. Tables are given for the three years 1913, 1914 and 1915 showing the increase. In August 1915, there were 1,149 cases of malaria, of which 261 were in civilians and 888 among the military. For the corresponding month of 1914 the number of cases had been only 12, and for 1913, 30. The embarrassment caused to the medical authorities can be imagined. All the usual methods for counteracting the scourge were taken.

J. B. N.

GALATA (G.). **Campagna antimalarica 1916 alla "Difesa marittima di Grado."** [Antimalarial Measures in 1916 in the Maritime Post of Grado.]—*Ann. Med. Nav. e Colon.* 1917. July-Aug. Year 23. Vol. 2. No. 7–8. pp. 597–624.

The district under consideration has an area of about 100 square kilometres, half consisting of permanent lagoon, while the remainder is composed of marsh and reclaimed land. The anti-malarial measures taken were of the usual kind, and are described in great detail. 94 cases of malaria were observed, of which 68 were of benign, and 26 of malignant, tertian. There was one death. The district is under military occupation.

J. B. N.

MELTZER. **Häufigkeit und Art der Chininexantheme.** [Quinine Rash: Its Frequency and Description.]—*Münch. Med. Woch.* 1918. Jan. 1. Vol. 65. No. 1. pp. 20–21.

From April to November a regiment of 3,200 men received prophylactic quinine, 0·3 gm. daily increased to 0·6 gm. twice a week [no further details]. Only 4 cases of quinine rash were seen, 2 of which were in officers. It was measles-like and thicker on the limbs than on the trunk. There was itching and oedema of the hands and feet and in one instance oedema of the face.

A. G. B.

LABADENS. **Note au sujet du traitement du paludisme.**—*Arch. Méd. et Pharm. Nav.* 1917. Nov. Vol. 104. No. 5. pp. 332–335.

There is nothing novel in this paper. The author expresses decided opinions, being incited, possibly, by the fact, as he says, that in the subject of malaria so many new discoveries of the well-known are being made nowadays.

A. A.

MEMMI (Guglielmo). **Norme per la cura e profilassi chininiche della malaria nell'adulto.** [Rules for the Cure and Prophylaxis of Malaria in the Adult with Quinine.]—*Riv. Crit. Clin. Med.* 1918. Jan. 12. Vol. 19. No. 2. pp. 22–24.

A set of rules for the administration of quinine in the treatment of malaria in its various forms in the adult. They conform generally to the rules given in the text-books, which, as is known, always vary to a certain extent according to the personal experience of the author.

J. B. N.

AUFRECHT-Magdeburg. **Die Therapie hartnäckiger Malariafälle.** [Treatment of Obstinate Malaria.]—*Berlin. Klin. Woch.* 1917. Oct. 29. Vol. 54. No. 44. pp. 1055–1056.

A short note in which the author, on an experience of 5 cases, recommends as a specific a formula for quinine and arsenic pills.

A. G. B.

HUELSE (W.). **Leukocytenblutbild und Fieber bei Malaria.** [The Leucocyte Blood Picture and Fever in Malaria.]—*Berlin. Klin. Woch.* 1917. Oct. 8. Vol. 54. No. 41. pp. 982–984. With 1 chart.

An intensive study of a few hours of a single case. A table is given showing the variations in percentages of 9 varieties of white corpuscles at 8 times between 10.0 a.m. and 5.30 p.m. with the corresponding temperatures, and a chart gives similar details of the uric acid and purins excretion and of the Arneth count.

A. G. B.

HIRSCHFELD (L.). **Ueber ein neues Blutszmptom bei Malariakrankheit.** [A New Blood Symptom in Malaria.]—*Correspondenz-Blatt f. Schweizer Aerzte.* 1917. Aug. 4. Vol. 47. No. 31. pp. 1007–1012.

The author finds that in the oxalate blood of malarial anaemics the red cells sink at a rate nearly in direct correspondence with the degree of anaemia. Oxalate blood is a non-clotting mixture of 9 parts blood and 1 part one-per-cent. No oxalate. As the author admits that the phenomenon is common to *all* forms of anaemia, it is not clear why he should suggest by the title of his paper that it has any peculiar diagnostic significance in malaria.

A. G. B.

FRAGA (Clementino). **Suprarenal Syndrome in Paludism.**—*New Orleans Med. & Surg. Jl.* 1917. Nov. Vol. 70. No. 5. pp. 443–445.

The author states that he has observed the symptoms of suprarenal insufficiency in two cases of malaria, and that until he read the papers of MM. PAISSEAU and LEMAIRE he thought his observations were novel.

A. A.

LÉGER (L.) & MOURIQUAND (G.). **Sur la répartition des stations d'anophèles dans le secteur médical Grenoble-Gap-Briançon et indications prophylactiques qui en découlent.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1917. Jan. 18. 3 Ser. Vol. 33. No. 1–2. pp. 16–22.

The authors define various *Anopheles* stations in the French Savoy region and discusses their significance from the malarial standpoint.

A. A.

DE MASSARY (E.) & TOCKMANN. **Un cas de paludisme avec réaction méningée violente, simulant la méningite cérébro-spinale.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1917. Dec. 13. 3 Ser. Vol. 33. No. 33–34. pp. 1195–1200. With 1 chart.

A detailed account of a case in which but for the enlarged spleen, the presence of malaria-parasites in the blood, and the reaction to quinine, the symptoms would have suggested cerebro-spinal meningitis.

A. A.

LABBÉ (Marcel). **Le foie des paludéens.**—*Bull. Acad. de Méd.* 1918. Jan. 15. 3 Ser. Vol. 79. Year 82. No. 2. pp. 54–55.

A short dissertation on hepatic derangement in recent malarial infection. The author states, *inter alia*, that he has never observed the reaction of acidosis in recent infections.

A. A.

MONTEZ (Julio). **Os arrozaes e a malaria.** [Rice-Fields and Malaria.] —*Med. Contemporanea.* 1917. Dec. 9. Vol. 35. No. 48. pp. 377–378.

The author, who is a district medical officer of health, enters a vigorous protest against the extension of rice-culture in Portugal. Formerly in his district there was but little malaria, and that of a benign type. Since the introduction of rice-fields and irrigation the amount of malaria has greatly increased, and the subtertian form has become common. No figures of any kind are given.

J. B. N.

LEHOTAY (Karl). **Zur Diagnose und Behandlung der Malaria tropica.** [Diagnosis on Treatment of Malaria.]—*Deut. Med. Woch.* 1918. Jan. 17. Vol. 44. No. 3. pp. 62–64. With 2 charts.

The author lecturing from some months' experience of malaria among troops in Albania fixes his attention upon "the scheme of temperature" which he would make the basis of a scheme of treatment.

A. A.

BLANC (G.). **Au sujet du Paludisme autochtone de la région du Lac Presba. (Note complémentaire.)**—*Bull. Soc. Path. Exot.* 1917. Nov. Vol. 10. No. 9. p. 804.

A note confirming the existence of indigenous malaria in the country west of L. Presba in Albania, as observed and recorded by Dr. LAMOUREUX [see this *Bulletin*, Vol. 11, p. 11].

A. A.

GALLI-VALÉRIO (B.). **La distribution géographique des Anophélines en Suisse au point de vue du danger de formation de foyers de malaria.** [Extract from *Bull. du Service Suisse d'Hyg. Pub.* 1917. Oct. 6 & 13. Nos. 39 & 40. pp. 440 & 453.]—*Bull. Office Intern. d'Hyg. Publique.* 1917. Dec. Vol. 9. No. 12. pp. 1566–1582.

This is a valuable report, but except as an example to the world it is only of local interest. It gives in much detail the situations of breeding-places of *Anopheles maculipennis* and *bifurcatus*, so far as the author has been able to investigate them, in the several cantons of Switzerland, with a view to charting the possible malaria-centres of the country.

A. A.

Book Reviews.

Fischer (J. C. H.). **Maatregelen tegen Malaria.** [Prevention of Malaria.]—xii + 176 pp. With 14 plates. Koloniaal Instituut te Amsterdam. Mededeeling No. 10. Afdeeling Tropische Hygiene No. 5. 1917 Amsterdam: J. H. de Bussy. [Price fl. 2.00.]

The author, a retired Major of Engineers, Dutch Indian Army, has a full knowledge of his subject and exposes it in such clear and simple language that the reading is easy and pleasant; technical terms, pure science, treatment, being purposely left to the doctors. Being well up to date the book is extremely useful to settlers in any part of the tropics, who in any circumstances could fall back upon it, and find advice, if not to suppress the mosquitoes, at least to reduce their numbers in such a way as to render the place habitable.

The subject matter is divided into six chapters, and these into sub-chapters—sections, etc., the titles of which are repeated "in margina." The various methods proposed are abundantly illustrated with examples of their application in various colonies, some failures being explained in order to make the reader plainly understand how, or how not, to work.

The Introduction gives a short definition of malaria, the means of transmission and the importance of the disease for the general population, the army and labourers. In Dutch India the incidence of malaria, which is rather high, is 39·8 per cent. of the general total of diseases; yet the mortality is only 7·3 per cent. of the total deaths in the district of Mangga Besar (Batavia), which is taken as an example.

In Chapter 2 we have a brief description of the mosquitoes—life, habits, etc., in general, and of the Anophelines in particular, with nomenclature of the South-East Asian species.

The anti-malaria measures *in Chapter* 3 are divided into three sections:—

(a) *The destruction of the parasite in man*, which is left to the medical man.

(b) *The destruction of the mosquito* (1) by hand killing, traps, fumigation by tobacco fumes or chemicals.

(2) The author gives a good and methodical description of the various relations between land and water, and how to deal with them by filling up and draining. Colmatage, or warping, employed in India, Dutch India, Italy and the South of France as a means to raise the ground is described in some detail. The process is very slow and at first always increases the malarial index, but it may be of use for big stretches of country. One would have liked the author to describe here the quick method (in which the Dutch are masters) for raising ground along rivers. They employed it at Galveston to raise the ground several metres, and on the left bank of the Scheldt at Antwerp. In many colonies dredgers have to be used to keep open a channel for navigation, the extracted slime being very cumbersome, but with the aid of a pump and big drains, it can be spread over the lowlands for a fairly long distance and at very little additional expense, and the ground thus treated can be used for cultivation or building purposes.

The description of drainage is very complete and so well illustrated that, without more ado, a settler could start and drain his own land successfully. Where drainage or filling up is not possible oil is employed.

(c) (1) *Protection of the Individual* by veils, gloves, boots, mosquito nets and mosquito proof rooms and buildings.

(2) *Protection of the Community* by avoiding dense population in a restricted area; by separation of white and coloured races; by choice of ground for the building and extension of towns—villages—compounds, and barracks; by metallic netting of the latter, useful hints being given as to its duration.

So far the *complete* separation of the white population from the natives has been accomplished only in one case, at Duala at the mouth of the Cameroon River, West Africa. For the white population 400 strong, 800

acres have been reserved round which is a belt about 5 miles long and 1,094 yards broad. Native buildings are only allowed outside these limits. Existing dwellings have been destroyed, or removed. The natives did not appreciate this general removal, and politically, such extreme measures are not always advisable, as they create the feeling that the white is cared for at the natives' cost. With this the reviewer fully agrees, but we all know how little the Germans have to say in their own country, leave alone natives in a German colony.

In Chapter 4 Major Fischer considers malaria in connection with agriculture, especially the cultivation of rice in Tonkin, Federated Malay States, British Guiana, the Andamans, Suriname, Dutch India Colonies and in Italy. The breeding of the mosquito in the marshy soil and malarial infection are not proportional and want further investigation.

Cattle and fish breeding are also mentioned, as is the influence of big works where considerable parts of the soil are disturbed. The following chapter, not less important, gives the principles of anti-malarial measures, the education of the population, propaganda, and the part played by Government.

In Italy the sale of quinine is a State monopoly with fixed maximum prices, its distribution for prophylactic and curative use being free to all labourers, and chargeable to the employer, while death due to malaria leads to compensation.

As a conclusion to this excellent little book, the author gives examples where anti-malarial measures have met with striking success :—

(1) In the Beni-Ounif Oasis (Algeria), the malarial infection falling from 85 per cent. to 3·7 per cent. (2) In the Island of Formosa, from 272·4 per cent. in 1897 to 51·2 per cent. in 1907. (3) In Ismailia town, the number of cases falling from 1,800 in 1885 to 55 cases in 1905.

In an Addendum we have an alphabetical list of 119 books, reviews, etc., consulted.

J. A. Beels.

MANSON (Sir Patrick) [G.C.M.G., M.D., LL.D. (Aberd.)]. **Tropical Diseases. A Manual of the Diseases of Warm Climates.**—xxii + 968 pp. With 12 coloured & 4 black & white plates & 254 text-figs. 6th Edition. 1917. London, New York, Toronto & Melbourne : Cassell & Co., Ltd. [Price 16*s.* net.]

The new Edition of "Manson" will be generally welcomed. Manuals of a group of diseases the knowledge of which is continually being increased tend to get out of date in 19 years notwithstanding periodical corrections and additions, and these are likely to upset the balance of a book, but here the additions have been, in nearly all cases, interwoven with skill so that the merits of the work published in 1898 have not suffered detraction from the changes in five subsequent editions, nor has the book become unwieldy. Twenty-eight pages of text have been added and 15 fresh figures, the latter chiefly in the Helminth section and illustrating recent work on schistosomiasis, the importance of which, with CLELAND, BRADLEY & McDONALD's demonstration of the insect vector of dengue in Australia, is mentioned in the Preface. Pellagra quits the "Fevers" section—one wonders how it got there—and appears, with beriberi, under Diseases of Undetermined Nature. A new chapter is headed "Ackers Poisoning," wherein Dr. Harold SCOTT's discovery of the cause of Vomiting Sickness of Jamaica is recognised ; this however is the only form of food poisoning that is described.

In any textbook of tropical medicine some errors and omissions may be detected by a critical reader but here, as far as the reviewer is able to judge, the errors and notable omissions are few ; and indeed with so many revisions most have by now been rectified. To take the subject with which the reviewer has some familiarity, PLIMMER and THOMSON (not Thompson) carried out their experiments with *T. brucei*, not *lewisi*, and *Glossina palpalis* occurs in Rhodesia as well as *G. morsitans*—on Lake Mweru, the south end of Tanganyika, and rivers connecting with these

lakes. In an account of "the best known and most important" trypanosomes of mammals we do not find *T. vivax,* which surely has a large literature and is more important, because more pathogenic, than *T. theileri.* The plate of *G. palpalis* gives a wrong idea of its colour; the fly appears as brown rather than black, its most striking character in nature. AUSTEN'S "Handbook of the Tsetse Flies" contains a much better representation by the same artist.

In the account of the African type of tick fever one misses that common symptom, facial paralysis, fortunately transient; the reviewer remembers an unhappy Indian in whose case it was double. Under the diagnosis of yellow fever would it not be well to mention that this disease and malaria may co-exist? Is the recommendation to the European to wear non-actinic colours, "a red or yellow shirt or a fabric into which these colours enter," based on any reliable experience or experiment? One fancied that it had received its coup de grace in the Philippines. From the retention of the three figures of Simulium in the chapter on pellagra it would seem that the author has not given up Dr. SAMBON'S belief of its insect transmission, but other views are given. The confusion attending the name of the Entamoeba of dysentery is witnessed by the fact that it is introduced as *E. tetragena,* though the more general *histolytica* is also used.

The chapter on the schistosomes has probably suffered more change than any other. LEIPER'S work is described and several of his figures are reproduced. The form *Schistosomum* is used for the genus; should not this be *Schistosoma*? In this connection it may be noted that according to the International Official List of Generic Names drawn up by the International Commission on Zoological Nomenclature the genus *Ankylostomum* (as here written) becomes *Ancylostoma.* It is to be hoped that Sir Patrick Manson and other authors of textbooks will fall into line with the zoologists. Misprints are very few; the reviewer met with one only of importance. On page 295 it is stated, "Experiments by ASHBURN and CRAIG . . . seemed to show that the germ of dengue . . . is ultra-microscopic and therefore unfilterable." Presumably "filterable" should be read.

One puts down the book with the feeling that of textbooks on Tropical Medicine others may contain more information and be more useful in the encyclopaedic sense, but as a readable, judicious and well digested, as well as handy, account of the diseases with which it deals, and above all as an introduction to the subject, "Manson" remains without a rival.

A. G. B.

WENYON (C. M.) & O'CONNOR (F. W.). **Human Intestinal Protozoa in the Near East. An Inquiry into some Problems affecting the Spread and Incidence of Intestinal Protozoal Infections of British Troops and Natives in the Near East, with Special Reference to the Carrier Question, Diagnosis and Treatment of Amoebic Dysentery, and an Account of Three New Human Intestinal Protozoa.** [Conducted under the Auspices of the Medical Advisory Committee, M.E.F. (January to August, 1916).]—218 pp. 1917. London: Published for the Wellcome Bureau of Scientific Research by John Bale, Sons & Danielsson, Ltd.

This book consists of four parts and an Appendix. The four Parts were published in the *Journal of the Royal Army Medical Corps* (Nos. 1–6, Jan. to June, 1917) and their content has been noted in this *Bulletin.* The Appendix is here printed for the first time; it contains the case reports, with charted findings, of patients treated for *E. histolytica* or flagellate infections. The book is well got up, is indexed, and is obviously a valuable record of work.

A. G. B.

DANIELS (C. W.) & NEWHAM (H. B.). **Laboratory Studies in Tropical Medicine**—xv + 560 pp. With 6 coloured plates, 164 figs. & 7 charts. Fourth Edition. 1918. London: John Bale, Sons & Danielsson, Ltd.

With reference to the review of this work by Prof. J. W. W. STEPHENS, Liverpool School of Tropical Medicine, which appeared in No. 3 (March) of this *Bulletin* C. W. DANIELS, M.B., F.R.C.P., writes as follows :—

"As this review is signed it merits some notice, though I think the practice of many editors of sending marked copies from the Editor is worthy of imitation but this review I have seen through the kindness of a friend.

"The main points seem to be to disparage the methods adopted at the London School of Tropical Medicine and a comparison of these with those followed in Liverpool, e.g.; the reviewer objects to the method of making blood films, the length of time taken for fixing, and the method of staining. As the object of these is to have good films and avoid as far as possible the breaking up of the more delicate elements in the blood, and secure good fixation and clean staining, I do not advocate other methods; and as the reviewer complains that sufficient attention is not paid to 'deceptions' common in other methods, rare in these, I consider that these attempts to avoid them are worth the trouble, and the methods we recommend are those in our opinion least likely to lead to disappointment and 'deceptions.' He recommends acetic acid preparations for dehaemoglobinising thick blood films and objects to the insufficient time (when dry) advocated. When thoroughly dry accidents rarely happen if plain water is used, but would with acetic acid preparations.

"We do not lay any stress on graphs of the lengths of trypanosomes, but we do not place much reliance on results of inoculation experiments, as in one of the cases infected with *T. rhodesiense* seen by Professor STEPHENS and myself rats lived for weeks after inoculation instead of, as in others infected from different sources with *T. rhodesiense*, some 8–10 days. Probably as in so many other things degree of pathogenicity can only be considered as a point in diagnosis and in separating species.

"As regards bacteriology, we do not claim this as a text book of that subject, nor do we as one of Entomology, Helminthology, etc.; nor do we compete with them, but we do consider that there are some special points which may be of value to tropical laboratory workers.

"The importance of Bacteriology in Tropical Medicine is valued differently by many authorities as indicated by examinations for Diplomata in Tropical Medicine. Cambridge includes some Bacteriology, Liverpool excludes it and diseases due to bacteria; the Conjoint Board insist on candidates passing in Bacteriology before they take the rest of the examination.

"I admit there are difficulties and am ready to adopt other methods when they are shown to be superior, but I do not agree that the inaccuracy of counting massed groups of leucocytes as seen at the sides and ends of a film, justifies the use of these in counts, though it would save time. In 1892 when I was working with Eosinophilia in Ankylostomiasis, I had to abandon the use of these parts of the film, and when I first saw in COLES' 'Blood' (1st edition 1898), the statement of the increase in large mononuclear elements in malaria, I doubted the statement, as he did not lay stress on the variable counts according to the part of the film examined. To use as an argument for the use of these parts of the film because there the most numerous leucocytes are found and doing so saves time and trouble, does not seem to me sound as different results are obtained if these parts of the film are used.

"I am prepared to admit that parts seem too elementary, but that is because we find that many of our students desire elementary instruction even in such matters as making blood films.

"General medical education is improving and we have hopes that soon, though not yet, we shall be able to weed out much that will not then be required and add others, but I doubt if these should include differences in the male genitalia of insects as a specific point of discrimination of species. This is a point rather in the department of pure Entomology."

The custom of the Bureau has always been to send a copy of the number containing a book review to the publisher who, it is presumed, would acquaint the author with the contents of the review. Undoubtedly in this instance a copy should have been addressed to Dr. DANIELS and the omission is much regretted. [ED.]